Assessing and Evaluating the Forest Stewardship Program: Promoting and Conducting Sound Wildlife Management

by

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(ABSTRACT)

A questionnaire was sent to all U.S. state and territorial Forest Stewardship Program (FSP) Coordinators in 1993 (response rate 90.2%). Despite differences in FSP design and implementation among states, the percentage of available non-industrial private forest (NIPF) acreage enrolled in the FSP ($\bar{x}$ = 3.4%) did not differ regionally. Professional foresters prepared over 80% of stewardship plans. However, FSP Coordinators perceived that, among all types of preparers, foresters had the greatest need for help in addressing wildlife issues. Most plan preparers had sought help with basic wildlife knowledge and specific, technical management recommendations, but not with field identification, even though site inspections were important in many states. Plan preparers relied on traditional methods (i.e., site inspection) rather than on newer technologies (i.e., computer databases) to inventory important natural/cultural resources. Nationally, landowners requested recommendations for general wildlife improvements more often than either consumptive or non-consumptive wildlife use objectives. Creating and/or managing snags, creating edge, developing food plots, and establishing mast producing species were recommended most often.

A second questionnaire was sent to 300 randomly chosen Virginia FSP participants (1991 - 1993) (response rate 81.3%) who declared "wildlife" as their primary or secondary management objective. Respondents reported high satisfaction with Virginia's FSP. Lack of time, money, and equipment, and not knowing where to find skilled help

were identified as impediments to implementing recommendations. Work on wildlife recommendations had been initiated by 37 - 69% of landowners.

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INTRODUCTION

Americans' demands for forest resources are increasing as the human population continues to grow (Hodge 1993). This increased demand is coupled with a decrease in available resources as forest lands are converted to other land use types, such as housing or agriculture. For example, in Virginia >8,000 ha of forestland are being lost each year to the construction of houses, shopping centers, roads, and other development projects (Virginia Department of Forestry 1995a). Americans have focused attention on acquiring particular critical habitats and recreational lands to preserve resources, but, to meet the resource needs of tomorrow, all landowners must be encouraged to manage their lands (Besandy 1988). There is an increased need for conscientious management of forests regardless of ownership or objectives, whether one is looking for financial or nonfinancial benefits. Now, more than ever, non-industrial private forest (NIPF) landowners need to be encouraged to be good forest stewards.

Stewardship can be defined as "an individual's responsibility to manage his[her] life and property with a proper regard to the rights of others" (Misk 1984: 1157). Thus, one might consider forest stewardship to be an individual landowner's responsibility to manage his/her forested land, whether for financial profit or other benefits, without negatively affecting other current and future landowners or jeopardizing the resource base. Practicing good forest stewardship can promote healthy fish and wildlife populations for consumptive or non-consumptive purposes, provide quality outdoor recreation, or produce forest products. It can help protect (i.e., guard or defend) forests from disease, insects, and wildfire. By using sound environmental and economic resource management principles, landowners who adopt a stewardship philosophy can help ensure a healthy, prosperous forest for current and future

generations (Virginia Department of Forestry 1992). Although many of the aforementioned objectives might be accomplished through other traditional forest management strategies, the stewardship concept implies an understanding that management decisions impact the future, and a sense of responsibility and accountability for one's actions.

Forest management objectives can vary from landowner to landowner. These objectives are influenced by long-term goals (e.g., physiological consistency, preservation of self, desire to belong, etc.), belief orientations, value standards, habits (or customs), ability, opportunity, expectations, self-commitment, and/or perceived support or opposition (Decker et al. 1987). Based on this list of influences, some landowners consider themselves to be or have interest in becoming stewards, while others do not.

To help NIPF landowners become good forest stewards, the United States Congress enacted the Forest Stewardship Act as part of the 1990 Food, Agriculture, Conservation and Trade Act. During its development, Senator Leahy of Vermont described the Forest Stewardship Act as a challenge to "the 8,000,000 private forest owners - who manage 482,000,000 acres [195,060,000 ha] of forest covered by 200 billion trees - to sustain and protect those forests for the future" (Gray 1990). The Forest Stewardship Program (FSP), a component of the Forest Stewardship Act, seeks to (1) help NIPF landowners, including any private individual, group, association, corporation, Indian tribe, or other private legal entity, manage their forested properties; (2) improve or enhance the health and productivity of forested lands for current and future landowners; and (3) increase the environmental and economic benefits derived from these lands (Appendix F in Virginia Department of Forestry 1992). To be eligible for participation in the FSP, landowners must own $\geq$4 ha of contiguous forested land, regardless of location or current use. Although enrolling in the FSP and accepting a forest stewardship plan represents a good faith agreement by the landowner to implement the recommended strategies, the entire process is voluntary.

The United States Department of Agriculture, U.S. Forest Service, administers and oversees the FSP, whereas the Department of Forestry or another designated natural resource agency in each of the 52 participating states and U.S. territories implements the FSP. In accordance with provisions of the Forest Stewardship Act, an authorized resource professional will develop a multiple resource forest stewardship management plan that blends the landowners' personal objectives for their forest lands with appropriate, sound management principles to accomplish such desires. However, states administer and implement the program differently. In Montana, for example, all forest stewardship plans are written by landowners after they have attended FSP training workshops (Logan 1994). Individualized and site-specific recommendations contained in each plan also are designed to protect resources that are unique, valuable or of other special concern, such as:

- historical and cultural sites (e.g., Native American or archeological);
- fish and wildlife populations;
- non-timber plants;
- recreation and aesthetic resources;
- soils;
- threatened and endangered species;
- timber;
- water and wetlands.

Each plan receives review and approval from the Regional Forester (or equivalent state official or designated representative) before being given to the landowner.

In some areas of the United States, the FSP provides more than just forest stewardship plans. It provides "how to" technical assistance to NIPF landowners on such issues as using Best Management Practices (BMP), reforesting with genetically improved seedlings, protecting wetlands, improving wildlife habitat, developing recreation opportunities, and preserving natural areas. The FSP provides examples of

management practice outcomes by using properties currently under FSP management as demonstration sites. It also offers incentives (e.g., plaques and other forms of recognition) for NIPF landowners to implement recommended management activities.

Virginia and the Forest Stewardship Program

In Virginia, 61% of the land is forested, of which 75% (4.3 million hectares) is owned by approximately 300,000 NIPF landowners (Virginia Department of Forestry 1992), including farmers, professionals, and recreationists who own and use their lands for income or enjoyment, or may simply have inherited it. These landowners come from many backgrounds and have a variety of management objectives. However, Hodge (1993) revealed that Virginia NIPF landowners primarily are interested in wildlife resources. The management decisions NIPF landowners make regarding wildlife and other forest resources can have profound impacts on the environment and the quality of life for current and future generations of Virginians. Unfortunately, many (46% of those surveyed by Hodge [1993]) of these landowners have never sought professional advice about managing their land, such as for assistance in developing a management plan for their property. As Williston et al. (1992:2-3) have suggested, "a well-prepared forest management plan serves as a roadmap (a series of scheduled activities) showing how to reach some predetermined destination (your management objectives)."

Virginia's FSP, as implemented by the Virginia Department of Forestry (VDOF) through its 6 administrative regions, draws together a variety of professionals from the forest industry, state and federal natural and historic resource agencies, and the private sector who provide technical assistance to Virginia NIPF landowners (i.e., they meet with landowners, inspect properties, and present management options). To enroll in the FSP, a landowner needs only contact his/her Area Forester and complete an application that identifies his/her land and clearly states his/her management objectives. The Area Forester or other resource professional will contact the

landowner to discuss further their objectives and to conduct a field inspection of the property. Following an evaluation of the land and the stated objectives, a 5-year forest stewardship management plan containing site-specific recommendations is developed.

Since its inception in 1991, Virginia's FSP has produced management plans for >2,000 landowners encompassing >144,000 ha (Virginia Department of Forestry 1995b). As noted previously, forest stewardship plans in Virginia are prepared mainly by VDOF staff, but also may be prepared by private forest consultants and industrial foresters who have received stewardship training from the VDOF. Although state wildlife biologists currently do not prepare plans, they make field visits, prepare management recommendations for incorporation into stewardship plans, and critically review management recommendations or suggestions of those who prepare plans.

The various agencies and individuals involved in the FSP invest much time and money in preparing forest stewardship plans. Currently, there is no solid measure of FSP success in terms of whether landowners actually implement recommendations. A major goal of the FSP is to have NIPF landowners implement good stewardship practices on their lands. Because the VDOF wants to make the FSP as effective and efficient as possible, and better serve the needs of its constituents, it is imperative that the VDOF assess, evaluate, and where appropriate, enhance its 5-year performance, improve landowner satisfaction with the FSP, and stimulate greater landowner implementation of management recommendations. The work undertaken in this project was designed to gather and interpret appropriate information to assist the VDOF in fulfilling that mission. Previous NIPF studies have focused mainly on NIPF timber supply, management, harvest, and regeneration (Bliss 1994). Surveys of NIPF landowner FSP participants have been done "focusing on [their] forest steawrdship articulations and behaviors" concerning harvesting (Egan and Jones 1993). Hodge's (1993) survey of Virginia NIPF landowners included collecting baseline demographic and harvest decision- making data. This thesis specifically addresses wildlife issues for

Virginia NIPF landowners who have participated in the FSP. The Virginia FSP was assessed and evaluated, with an emphasis on how it addresses wildlife issues.

Objectives

My specific objectives were:

1. To assess variations among state FSPs in terms of program design and implementation;

2. To assess, on a national scale, landowners' objectives pertaining to wildlife;

3. To assess the frequency with which wildlife recommendations are given to landowners involved in state and territorial FSP;

4. To assess participating landowners' satisfaction with Virginia's FSP;

5. To assess the degree to which landowners implement wildlife practices recommended in the forest stewardship plan they receive; and

6. To develop recommendations for the VDOF to improve efficiency, field administration, and delivery of the Virginia FSP and to encourage greater landowner implementation of management recommendations.

CHAPTER 2
METHODS

Review of the Forest Stewardship Program at Federal Level

A self-administered mail survey (see Appendix A) designed to collect information necessary to assess variations among FSPs was sent to the FSP Coordinator in each state and U.S. territory in spring 1994. The survey instrument included questions about forestland ownership, FSP administration, NIPF landowners' objectives, plan recommendations, and follow-up stewardship and certification protocols. The prototype questionnaire was reviewed for content and question ambiguity by 6 Virginia Tech Department of Fisheries and Wildlife Sciences faculty and graduate students, and was pre-tested on the FSP Coordinator and Chief of Forest Management for Virginia. Names and addresses of FSP state and territory Coordinators were obtained from U.S. Forest Service FSP regional directors.

Following the 4-step total design method (Dillman 1978), each survey subject was mailed a questionnaire, a postage-paid return envelope, and a cover letter that described project objectives and encouraged their participation in May. Three weeks later, a postcard reminder was sent to each non-respondent encouraging them to complete and return the survey. After 3 more weeks, a second copy of the survey, a new cover letter, and another postage-paid return envelope were sent to each non-respondent. Three weeks later, a final postcard reminder was sent to all remaining non-respondents announcing the closure of the survey and encouraging their participation. After the closing of the mail survey, I attempted to contact all remaining non-respondents by telephone to obtain their answers to the survey's questions.

Review of the Forest Stewardship Program in Virginia

A second mail survey (see Appendix B) was designed to solicit information from FSP participants in Virginia and included questions on landowner and property demographics, management objectives, impressions of the plan received, plan implementation, and problems encountered during the plan-making process or with implementation of the plan. The prototype questionnaire was reviewed by 6 Virginia Tech Department of Fisheries and Wildlife Sciences faculty and graduate students. Questionnaires were sent to 300 randomly chosen NIPF landowners in Virginia who (1) had forest stewardship plans prepared during VDOF fiscal year 1991, 1992, or 1993, (2) had declared "wildlife" as either their primary or secondary management objective, and (3) were not included in VDOF's own FSP satisfaction survey that began in late 1993. A list of all potential landowners meeting these criteria, obtained from VDOF, was stratified so that approximately 70% of each year's population was sampled (1991: $\underline{n}$ = 78, 1992: $\underline{n}$ = 102, 1993: $\underline{n}$ = 120). Names of survey subjects for each year were drawn using a random number table (Noether 1976) to establish both a starting point and the interval between selected landowners. For example, if the number 5 was chosen, the 5th and every following 5th landowner were selected.

Again, the 4-step total design method (Dillman 1978) was used. A questionnaire, a postage-paid return envelope, and a cover letter that described the project's intent and encouraged landowner participation were mailed in June 1994. Four weeks after the initial mailing, a postcard reminder was sent to each non-respondent encouraging them to complete and return the survey. A second copy of the survey, a new cover letter, and another postage-paid return envelope were sent to each non-respondent 3 weeks after the postcard mailing. Three weeks later, a final postcard reminder was sent to all remaining non-respondents announcing the closure of the survey and encouraging their participation.

Analysis of Data

Responses obtained from participants in each survey were coded and entered into separate databases for analysis on Virginia Tech's CMS System mainframe computer (IBM 3090 model 300E/VF). I used the Statistical Package for Social Sciences (SPSS) (SPSS, Inc. 1990a,b) and Windows Minitab Statistical Software 10Xtra for computations. Further data management and production of tables and graphs were done using Microsoft Word 6.0 and Microsoft Excel 5.0 for Windows 3.1 and QuattroPro 3.0.

Each survey data set was subdivided into predetermined groupings for analysis. For the national survey, states were grouped into 3 regions in accordance with FSP administrative management units (Region 1--West, Region 2--North, Region 3--South). States also were placed into subregions in accordance with U.S. Forest Service's 7 administrative regions (see Powell et al. 1993 and Appendix C). For Virginia, survey respondents were grouped by year of initial participation, by VDOF's 6 administrative regions, and by the 3 major physiographic regions of Virginia (as described by Hoffman 1969, Harvill et al. 1977, Larner 1979) (see Appendices D and E). Responses were placed into appropriate administrative and physiographic regions according to the county in which the respondent's forest stewardship property was located. If a property overlapped ≥ 2 counties that were in different regions, the responses were not used in regional comparisons. Due to a problem with coding, the year of initial FSP participation could not be determined for 25 surveys; these were not used in any analysis examining effect of differences among years.

For both data sets, I calculated simple descriptive statistics, such as frequencies, means, ranges, and estimates of variability, on response variables using SPSS Frequencies procedure (SPSS, Inc. 1990a). Reported values for a state's total forested area were compared to 1992 forest resource data (Powell et al. 1993) to confirm that responses represented total forested area, not just commercial forested area. Percent

NIPF with plans and average area per plan were calculated for each state that reported total forested area, the percent NIPF ownership, and approximate total area represented by plans. For each landowner that responded to amount of land owned in Virginia and amount of land enrolled in Virginia's FSP, percentage of total land holdings owned included in the FSP was calculated. Kruskal-Wallace (K-W) test with multiple comparisons (overall α set at 0.10) (Noether 1976) was used to examine for differences in responses among regions of the U.S. and among years, administrative regions, and physiographic regions of Virginia. K-W or Mann-Whitney (M-W) (Wilcoxon Rank Sum) tests (Noether 1976) also were used to examine for differences in responses to questions relating to landowner demographics and property parameters. To test independence of categorical variables, contingency tables were developed and analyzed (e.g., chi-square test) using Crosstabs procedure (SPSS, Inc. 1990a). For contingency tables that had $>20\%$ of cells with expected frequencies <5 and $\underline{P}>0.05$, categories were collapsed where feasible in an attempt to better meet test assumptions. Original categories of age were regrouped from 20 - 29, 30 - 39, 40 - 49, 50 - 59, 60 - 69, and $\geq$70 years into 20 - 39, 40 - 59, and $\geq$60 years. Original education categories were regrouped from no formal schooling, grade school, high school, associate degree, Bachelor's degree, and advanced college degree (M.D., M.S., Ph.D., J.D.) into $\leq$high school, associate or Bachelor's degree, and advanced college degree. Original income categories were regrouped from <\$25,000, \$25,000 - 49,999, \$50,000 - 99,999, \$100,000 - 124,999, \$125,000 - 150,000, and $\geq$\$150,000 into <\$25,000, \$25,000 - 49,999, \$50,000 - 99,999, \$100,000 - 150,000, and >\$150,000. Original categories for number of days per year that landowners visit their stewardship properties specifically to conduct natural resource management activities were regrouped from <3, 4 - 7, 8 - 14, 15 - 30, and >30 days into <7, 8 - 30, and >30 days. This regrouping captures landowners who visit for up to a week, from a week to a month, and for more than a month. Likert scale variables were collapsed by removing the "not sure" responses and by combining related response types (i.e.,

strongly disagree with disagree, strongly agree with agree). In tables where >20% of cells still had expected frequencies <5 and $\underline{P}>0.05$, no statistical conclusions were drawn. Cell X^2 tests (D.F. Stauffer, Associate Professor of Wildlife, Virginia Polytechnic Institute and State University, pers. commun.) were done on contingency tables where $\leq$20% of cells had expected frequencies <5 or $\underline{P}<0.05$. Pearson's r test (Noether 1976) was calculated to determine independence for distance from main residence to stewardship property, amount of land owned in Virginia, and percentage of total land holdings owned in Virginia included in the FSP. Continuous variables, such as distance from main residence to stewardship property, amount of land owned in Virginia, percentage of total land holdings owned in Virginia included in the FSP, and length of time of property ownership of the stewardship property, were reclassified into ranges for contingency table comparisons as follows: $\leq$80.5 km, 80.5 - 402.3 km, $\geq$402.3 km; $\leq$40.5 ha, 40.6 - 202.3 ha, $\geq$202.3 ha; $\leq$33%, 34 - 66%, >66%; $\leq$1 year, 2 - 3 years, 4 - 5 years, 6 - 10 years, and >10 years. Regression analysis was used to examine relationships between the number of plans written and the total amount of forested area, the percent NIPF ownership of forested land, and the number of NIPF landowners among states, and the visitation rate and amount of land owned in Virginia enrolled in the FSP.

CHAPTER 3
RESULTS

Survey Response Rates

Of the 51 surveys originally mailed to state and territorial FSP Coordinators, 42 were completed and returned. Data also were obtained from 4 non-respondents by administering the survey via telephone interview. Only American Samoa, Maine, Michigan, New Mexico, and Oregon did not respond or declined to participate. Overall response rate was 90.2%. Response rates among regions varied minimally and were all high (West: 84.2%, North: 90.0%, South: 100%).

Of the 300 surveys mailed to Virginia NIPF landowners, 221 were completed and returned, 20 were unusable, and 8 were returned undeliverable by the U.S. Postal Service, for an adjusted overall response rate of 81.3%. Adjusted response rates among years (based on 196 responses) were relatively consistent (1991: 76.1%, 1992: 64.2%, 1993: 75.7%). Distribution of response among VDOF administrative regions and by physiographic regions was as follows: Region 1--22, Region 2--16, Region 3--54, Region 4--32, Region 5--79, Region 6--16; Mountain region--81, Piedmont region --106, Coastal region--32.

Not all FSP Coordinators and Virginia FSP participants from 1991 through 1993 that returned useable surveys answered all the questions. Therefore, the total number of responses differed from question to question. Throughout this chapter, the total number of responses to a question will be reported as $\underline{n}$ to denote the different number of responses among questions. Standard error is denoted by "$\pm$" after the mean.

Forest Stewardship Program at the National Level

Forest Stewardship Plans

According to FSP Coordinators, 259,457,471 ha of forested land existed in the U.S. and its territories in 1994. Estimates of the amount of forested land by state ranged from approximately 30,000 ha (Guam) to >52,000,000 ha (Alaska) ($\bar{x}$ = 5,640,380 $\pm$ 1,170,254 ha, $\underline{n}$ = 46) (Table 1). Ownership of forested lands, on a national scale, was categorized as 19% federal, 10% state or other public, 8% private industrial, and 63% private non-industrial. However, among regions, "public" (federal, state and other public) lands accounted for a significantly greater percentage of total forested area in the West than in the North and South (K-W X^2 = 14.683, df = 2, $\underline{P}$ = 0.001). "Private" (private industrial and non-industrial) ownership represented significantly more area in the North and South than in the West (K-W X^2 = 13.001, df = 2, $\underline{P}$ = 0.002). Among states/territories, Guam had the highest percentage of "public" lands (94%), whereas Kansas, Nebraska, and Ohio had the highest amount of NIPF lands (96%, 95%, 94% respectively) (Table 1).

As of January 1, 1994, 42,270 forest stewardship plans had been prepared for NIPF landowners nationwide ($\bar{x}$ = 983 $\pm$ 224.3 plans/state, $\underline{n}$ = 43) (Table 2). Among regions, preparers in the North produced more plans (30,042) than their counterparts in either the South (7,520) or, significantly so, the West (4,706) (K-W X^2 = 8.575, df = 2, $\underline{P}$ = 0.014). Subregion 4 (North Central) alone accounted for approximately 50% of all plans written. Wisconsin reported the greatest number of plans (6,728), whereas Hawaii had the fewest (14). There was no significant relationship between the number of plans written and the total amount of forested area, the percent NIPF ownership of forested land, and the number of NIPF landowners among states (regression equation: number of plans = 598 - 0.000004 (forested area)

Table 1. Area (ha) and ownership or management responsibility (%) of forest lands in the U.S. and territories in 1994, as reported by FSP coordinators.

State/ Territory	Total Forested Area (ha)	Ownership/Management Responsibility			
		Federal (%)	State and Other Public (%)	Private Industrial (%)	Private Non-industrial (%)
Subregion 1					
AK	52,204,623	12	55	0	23
CA	19,424,976	41	4	18	37
GU	29,930	75	19	1	5
HI	687,968	0	50	0	50
WA	8,498,427	33	20	23	24
Subtotal[a]	80,845,924	32.2	29.6	8.4	27.8
Subregion 2					
AZ	8,012,803	53	6	0	41
CO	8,377,021	67	3	0	29
ID	5,867,962	71	7	8	13
MT	9,307,801	61	4	12	23
NV	4,724,721	.	.	.	.
UT	6,515,461	80	5	0	15
WY	3,956,301	.	.	.	.
Subtotal	46,762,068	66.4	5	4	24.2
Subregion 3					
KS	566,562	3	1	0	96
ND	413,833	17	5	3	85
NE	404,687	1	4	0	95
SD	689,506	68	5	1	26
Subtotal	2,074,587	22.3	3.8	1	75.5
REGION 1 Total	129,682,580	40.3	13.4	4.7	40.1
Subregion 4					
IA	890,311	.	.	.	.
IL	1,719,920	6	2	2	90
IN	1,740,154	9	6	0	85
MN	7,041,554	17	38	5	40
MO	5,260,931	11	3	1	85
OH	3,197,027	3	3	0	94
WI	5,948,899	12	19	12	57
Subtotal	25,798,796	9.7	11.8	3.3	75.2
Subregion 5					
CT	728,437	0	20	0	80
DE	157,423	0	7	7	86
MA	1,305,197	1	15	2	82
MD	1,092,655	1	9	5	85
NH	2,018,255	10	4	14	72
NJ	1,092,655	.	.	.	.
NY	7,486,710	1	22	5	72
PA	6,474,992	3	10	4	75
RI	163,898	1	11	0	88
VT	1,838,898	5	7	9	79
WV	4,896,713	8	2	7	83
Subtotal	27,255,831	3.3	10.7	5.3	80.2
REGION 2 Total	53,054,628	6.5	11.1	4.6	78.3

Table 1. (continued).

State/ Territory	Total Forested Area (ha)	Ownership/Management Responsibility			
		Federal (%)	State and Other Public (%)	Private Industrial (%)	Private Non-industrial (%)
Subregion 6					
AL	22,000000	3	3	32	62
AR	17,687,000	4	3	29	64
KY	12,700,000	5	2	3	90
LA	13,800,000	.	.	.	.
MS	16,981,500	9	2	20	66
OK	4,046,870	2	8	10	80
TN	5,368,254	8	4	9	80
TX	4,734,838	6	1	33	60
Subtotal	14,149,962	5.3	3.3	19.4	71.7
Subregion 7					
FL	6,677,336	10	6	36	48
GA	9,550,613	.	.	.	.
NC	7,567,647	8	2	13	77
SC	5,117,493	7	2	19	72
Subtotal	28,913,088	8.3	3.3	22.7	65.7
REGION 3 Total	76,720,261	6.2	3.3	20.4	69.9
OVERALL	259,457,468	18.8	10	8.6	62.9

[a] Area subtotals and totals are sums of individual state/territory or subregion values, whereas ownership subtotals and totals are means.

Table 2. Number of Forest Stewardship Plans completed, area represented by those plans, mean area per plan, and percent of available NIPF area under planning acreages in the U.S. and territories, as of January 1, 1994, as reported by FSP Coordinators.

State/ Territory	Number of Stewardship Plans (as of 1/94)	Area Under Planning (as of (1/94) (ha)	Mean Area Per Plan (ha)	Percent of Available NIPF Area Under Planning (as of 1/94[a])
Subregion 1				
AK	40	202,344	5,058.6	1.69
CA	190	72,844	383.4	1.01
GU	35	809	23.1	54.08
HI	14	488	34.9	0.14
WA	721	27,923	38.7	1.37
Subtotal[b]	1,000	304,408	304.4	11.7
Subregion 2				
AZ	40	38,041	951.0	1.16
CO	1,340	60,298	45.0	2.48
ID	.	.	.	.
MT	350	84,984	242.8	3.97
NV	35	2,833	80.9	.
UT	54	14,044	260.1	1.44
WY	326	13,967	42.8	.
Subtotal	2,145	214,168	99.8	2.3
Subregion 3				
KS	520	2,752	5.3	0.51
ND	373	7,361	19.7	2.09
NE	250	6,880	27.5	1.79
SD	420	5,662	13.5	3.16
Subtotal	1,563	22,655	14.5	1.9
REGION 1 Total	4,708 A[c]	541,231 A	115.0 AB	5.8 A
Subregion 4				
IA	3,145	38,786	12.3	.
IL	1,934	31,404	16.2	2.03
IN	.	.	.	.
MN	4,500	185,725	41.3	6.59
MO	1,060	58,153	54.9	1.3
OH	3,600	81,342	22.6	2.71
WI	6,728	167,469	24.9	4.94
Subtotal	20,967	562,880	26.8	3.5
Subregion 5				
CT	15	2,023	134.9	0.35
DE	58	1,968	33.9	1.45
MA	355	14,674	41.3	1.37
MD	1,410	30,563	21.7	3.29
NH	764	66,002	86.4	4.54
NJ	100	6,070	60.7	.
NY	4,237	119,728	28.3	2.22
PA	500	23,472	46.9	0.48
RI	180	1,821	10.1	1.26
VT	400	18,211	45.5	1.25
WV	1,056	56,213	53.2	1.38
Subtotal	9,075	340,746	37.5	1.8
REGION 2 Total	30,042 B	903,626 A	30.1 B	2.3 A

Table 2. (continued).

State/ Territory	Number of Stewardship Plans (as of 1/94)		Area Under Planning (as of (1/94) (ha)		Mean Area Per Plan (ha)		Percent of Available NIPF Area Under Planning (as of 1/94)	
Subregion 6								
AL	600		202,344		337.2		3.67	
AR	450		.		.		.	
KY	3,405		137,081		40.3		2.96	
LA	210		9,104		43.4		.	
MS	470		42,339		90.1		0.93	
OK	200		22,258		111.3		0.69	
TN	450		39,659		88.1		0.92	
TX	80		7,689		96.1		0.27	
Subtotal	5,865		460,474		78.5		1.6	
Subregion 7								
FL	300		60,703		202.3		1.89	
GA	776		115,947		149.4		.	
NC	.		.		.		.	
SC	579		71,980		124.3		1.95	
Subtotal	1,655		248,630		150.2		1.9	
REGION 3 Total	7,520	AB	709,104	A	94.3	A	1.7	A
OVERALL	42,270		2,153,961		51.0		3.4	

[a] Percent available NIPF land under planning = [area under stewardship planning ÷ (percent NIPF forested land × total forested land) × 100].

[b] Number of stewardship plans and area under plan subtotals and totals are sums; mean area per plan and percent available NIPF area under planning subtotals and totals are means.

[c] For each region, means and totals within a column denoted by the same capital letter are not different ($P < .05$).

+ 0.2 (percent NIPF ownership of forested land) + 0.00265 (number of NIPF landowners); $R^2 = 0.0$; df = 3; $\underline{P} = 0.457$).

The total area under stewardship planning was 2,153,962 ha ($\bar{x}$ = 51,285 $\pm$ 8,835 ha/state, $\underline{n}$ = 42) and ranged from 488 (Hawaii) to 202,344 ha (Alabama and Alaska) (Table 2). No significant difference among regions in the amount of area under planning was detected (K-W X^2= 4.153, df = 2, $\underline{P}$ = 0.125).

Nationally, the mean area per plan was 220 $\pm$ 121 ha and ranged from 5 (Kansas) to 5,059 ha (Alaska) (Table 2). The dichotomy between the number of plans and area under planning can be explained by the difference in mean area per plan among states. The West had a larger average number of hectares per plan per state (115 ha/plan/state) than the South (94 ha/plan/state) and the North (30 ha/plan/state). However, when I tested for significant differences among regions, the mean rank sum for the South was greater than that for the West and, significantly so, more than the North (K-W X^2= 7.978, df = 2, $\underline{P}$ = 0.019). This discrepancy in ranking most likely was due to the large inherent variation in amount of land per plan in the West (5 - 5,059 ha/plan).

Nationally, only 3.4 $\pm$ 1.5% ($\underline{n}$=36) of the available NIPF area currently was under stewardship planning (Table 2). Eighty-three percent of the states were below that average. No regional differences in the percent of NIPF under planning were detected (K-W X^2= 0.875, df = 2, $\underline{P}$ = 0.646). Guam reported the highest percentage of NIPF lands under planning (54.1 %); Hawaii had the lowest (0.1 %).

Although national FSP standards and guidelines allow individuals from various occupations potentially to prepare stewardship plans, not all states permitted these individuals to prepare plans (Table 3). Even if an occupational group was allowed to prepare plans, they did not necessarily actually prepare them. State and consulting foresters were allowed to write plans in 93.9% of the states, but actually prepared plans in only 87.9% and 78.8% of the states, respectively. Industrial foresters were permitted to prepare plans in 84.8% of the states, but only 45.5% of the states actually

Table 3. Individuals who are allowed to prepare stewardship plans (ALLOW), who have actually prepared plans (ACTUAL), and the percentage of plans prepared by them (%) as of January 1, 1994.

State/	State Foresters			Wildlife Biologists			Consulting Biologists			Consulting Foresters		
Territory	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%
Subregion 1												
AK	X	X	93	X	.	0	X	.	0	X	X	5
CA	X	X	2	X	.	0	X	X	1	X	X	30
GU	X	.	0	X	.	0	X	.	0	X	.	0
HI	X	.	0	X	.	0	X	.	0	X	X	100
WA	X	X	10	X	X	6	X	X	1	X	X	47
Subtotal[a]	100	60	21.0	100	20	1.2	100	40	0.4	100	80	36.4
Subregion 2												
AZ	X	X	50	X	.	0	X	X	25	X	X	25
CO	.	.	.	.	.	.	.	.	.	.	.	.
ID	.	.	.	.	.	.	.	.	.	.	.	.
MT	.	.	0	.	.	0	.	.	0	.	.	0
NV	X	X	3	X	.	0	X	.	0	X	X	1
UT	X	X	100	.	.	0	.	.	0	X	.	0
WY	X	X	30	X	X	1	.	.	0	.	.	0
Subtotal	80	80	36.6	60	20	0.2	40	20	5.0	60	40	5.2
Subregion 3												
KS	X	X	80	X	X	5	X	.	0	X	.	0
ND	X	X	87	.	.	0	.	.	0	X	X	4
NE	X	X	95	X	X	1	X	.	0	X	.	0
SD	X	X	99	X	.	0	X	.	0	X	X	1
Subtotal	100	100	90.3	75	50	1.5	75	0	0.0	100	50	1.3
REGION 1 Mean	92.9	78.6	46.4	78.6	28.6	0.9	71.4	21.4	1.9	85.7	57.1	15.2

Table 3. (contineud).

State/	State Foresters			Wildlife Biologists			Consulting Biologists			Consulting Foresters		
Territory	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%
Subregion 4												
IA	X	X	80	X	X	1	X	.	0	X	X	19
IL	X	X	94	X	X	3	X	.	0	X	X	2
IN	X	X	95	X	X	1	X	X	1	X	X	1
MN	X	X	80	X	X	1	X	.	0	X	X	10
MO	X	X	94	X	.	0	X	.	0	X	X	6
OH	X	X	90	X	X	3	X	.	0	X	X	5
WI	X	X	89	X	X	1	X	.	0	X	X	10
Subtotal	100	100	88.9	100	85.7	1.4	100	14.3	0.1	100	100	7.6
Subregion 5												
CT	.	.	0	.	.	0	X	.	0	X	X	95
DE	X	X	100	X	.	0	.	.	0	X	.	0
MA	.	.	.	.	.	.	.	.	.	.	.	.
MD	X	X	90	X	X	7	X	X	1	X	X	2
NH	.	.	.	.	.	.	.	.	.	.	.	.
NJ	.	.	.	.	.	.	.	.	.	.	.	.
NY	X	X	80	X	.	0	X	X	5	X	X	10
PA	.	.	.	.	.	.	.	.	.	.	.	.
RI	.	.	.	.	.	.	.	.	.	.	.	.
VT	.	.	.	.	.	.	.	.	.	.	.	.
WV	X	X	22	X	.	0	X	X	1	X	X	76
Subtotal	80	80	58.4	80	20	1.4	80	60	1.4	100	80	36.6
REGION 2 Mean	91.7	91.7	76.2	91.7	58.3	1.4	91.7	33.3	.67	100	91.7	19.7

Table 3. (continued).

State/ Territory	State Foresters			Wildlife Biologists			Consulting Biologists			Consulting Foresters		
	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%
Subregion 6												
AL	X	X	75	.	.	0	X	X	2	X	X	21
AR	.	.	.	.	.	.	.	.	.	.	.	.
KY	X	X	99	.	.	0	.	.	0	X	X	1
LA	.	.	.	.	.	.	.	.	.	.	.	.
MS	X	X	56	X	.	0	X	X	3	X	X	40
OK	X	X	90	X	X	1	X	.	0	X	X	10
TN	X	X	95	.	.	0	.	.	0	X	X	2
TX	X	X	70	X	X	2	X	X	2	X	X	25
Subtotal	100	100	80.8	50	33.3	0.5	66.7	50	1.2	100	100	16.5
Subregion 7												
FL	.	.	.	.	.	.	.	.	.	.	.	.
GA	X	X	52	X	X	1	X	.	0	X	X	45
NC	.	.	.	.	.	.	.	.	.	.	.	.
SC	.	.	.	.	.	.	.	.	.	.	.	.
Subtotal	100	100	52	100	100	1	100	0	0	100	100	45
REGION 3 Mean	100	100	76.7	57.1	42.9	0.6	71.4	42.9	1.0	100	100	20.6
OVERALL Mean	93.9	87.9	63	78.8	42.4	1	78.8	30.3	1	93.9	78.8	18

Table 3. (continued).

State/ Territory	Industrial Foresters			NRCS/SCS			Landowners			Other Preparers		
	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%
Subregion 1												
AK	X	.	0	X	X	2	.	.	0	.	.	0
CA	X	X	6	X	X	15	.	.	0	X	X	46
GU	X	.	0	X	X	100	.	.	0	.	.	0
HI	X	.	0	.	.	0	.	.	0	.	.	0
WA	X	X	1	X	X	10	X	X	20	X	X	5
Subtotal	100	40	1.4	80	80	25.4	20	20	4.0	40	40	10.2
Subregion 2												
AZ	X	.	0	.	.	0	.	.	0	.	.	0
CO	.	.	.	.	.	.	.	.	.	.	.	.
ID	.	.	.	.	.	.	.	.	.	.	.	.
MT	.	.	0	.	.	0	X	X	100	.	.	0
NV	.	.	0	X	X	96	.	.	0	X	.	0
UT	X	.	0	.	.	0	.	.	0	.	.	0
WY	X	X	1	X	X	70	.	.	0	.	.	0
Subtotal	60	20	0.2	40	40	33.2	20	20	20.0	20	0	0.0
Subregion 3												
KS	.	.	0	X	X	15	.	.	0	.	.	0
ND	.	.	0	X	X	7	.	.	0	X	X	2
NE	X	.	0	X	X	3	.	.	0	X	X	1
SD	X	.	0	.	.	0	.	.	0	.	.	0
Subtoal	50	0	0.0	75	75	6.3	0	0	0.0	50	50	0.8
REGION 1 Mean	71.4	21.4	0.6	64.3	64.3	22.7	14.3	14.3	8.6	35.7	28.6	3.9

Table 3. (continued).

State/ Territory	Industrial Foresters			NRCS/SCS			Landowners			Other Preparers		
	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%
Subregion 4												
IA	X	.	0	.	.	0	.	.	0	.	.	0
IL	X	X	1	.	.	0	.	.	0	.	.	0
IN	X	X	1	.	.	0	.	.	0	.	.	0
MN	X	X	1	X	X	8	.	.	0	X	X	1
MO	X	.	0	X	.	0	.	.	0	X	.	0
OH	.	.	0	X	X	3	.	.	0	.	.	0
WI	X	X	1	.	.	0	X	X	1	X	X	1
Subtotal	85.7	57.1	0.6	42.9	28.6	1.6	14.3	14.3	0.1	42.9	28.6	0.3
Subregion 5												
CT	X	X	5	.	.	0	.	.	0	.	.	0
DE	X	.	0	.	.	0	.	.	0	.	.	0
MA	.	.	.	.	.	.	.	.	.	.	.	.
MD	X	.	0	.	.	0	.	.	0	.	.	0
NH	.	.	.	.	.	.	.	.	.	.	.	.
NJ	.	.	.	.	.	.	.	.	.	.	.	.
NY	X	X	5	.	.	0	.	.	0	.	.	0
PA	.	.	.	.	.	.	.	.	.	.	.	.
RI	.	.	.	.	.	.	.	.	.	.	.	.
VT	.	.	.	.	.	.	.	.	.	.	.	.
WV	X	X	1	.	.	0	.	.	0	.	.	0
Subtotal	100	60	2.2	0	0	0.0	0	0	0.0	0	0	0.0
REGION 2 Mean	91.7	58.3	1.3	25	16.7	.9	8.3	8.3	0.1	25	16.7	0.2

Table 3. (continued).

State/ Territory	Industrial Foresters			NRCS/SCS			Landowners			Other Preparers		
	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%	ALLOW	ACTUAL	%
Subregion 6												
AL	X	X	2	.	.	0	.	.	0	.	.	0
AR	.	.	.	.	.	.	.	.	.	.	.	.
KY	X	.	0	.	.	0	.	.	0	.	.	0
LA	.	.	.	.	.	.	.	.	.	.	.	.
MS	X	X	1	.	.	0	.	.	0	.	.	0
OK	X	.	0	.	.	0	.	.	0	X	X	1
TN	X	X	3	.	.	0	.	.	0	.	.	0
TX	X	X	1	.	.	0	.	.	0	.	.	0
Subtotal	100	66.7	1.2	0	0	0	0	0	0	16.7	16.7	0.2
Subregion 7												
FL	.	.	.	.	.	.	.	.	.	.	.	.
GA	X	X	1	X	X	2	.	.	0	.	.	0
NC	.	.	.	.	.	.	.	.	.	.	.	.
SC	.	.	.	.	.	.	.	.	.	.	.	.
Subtotal	100	100	1	100	100	2	0	0	0	0	0	0
REGION 3 Mean	100	71.4	1.1	14.3	14.3	0.3	0	0	0.0	14.3	14.3	0.1
OVERALL Mean	84.8	45.5	1	39.4	36.4	10	9.1	9.1	4	27.3	21.2	2

[a] ALLOW and ACTUAL subtotals and means are the percent of states in a subregion or region; % subtotals and means are the mean of states' responses in a subregion or region.

had them preparing plans. State, private consulting, and industrial foresters prepared 82% of all stewardship plans (63%, 18%, 1% respectively). State and consulting wildlife biologists were allowed to prepare plans in 78.8% of the states, yet they actually prepared plans in only 42.4% and 30.3% of the states, respectively. In Subregions 1 (Pacific Coast), 2 (Inter-mountain), and 5 (Northeast), only 20% of the states actually had plans prepared by state wildlife biologists. State and consulting biologists prepared 2% of all stewardship plans (1% each). Stewardship plans also were prepared by Natural Resources Conservation Service (NRCS) (formerly Soil Conservation Service [SCS]) personnel (10%), landowners (4%), and "others" (2%) (includes Bureau of Land Management [BLM] staff, college students, consulting soil scientists or other soil experts, land use planners, Nature Conservancy personnel, Natural Resources Districts [NRD] staff, open space planners, range experts, state land resource staff, and other natural resource professionals). State foresters prepared approximately 90% of the stewardship plans in Subregion 3 (Great Plains) and $\geq$95% of plans in Delaware, Indiana, Kentucky, Nevada, South Dakota, Tennessee, and Utah. State wildlife biologists prepared no more than 7% of any state's stewardship plans. Among consulting wildlife biologists, those in Arizona provided the highest contribution (25%) of all plans written in any state. Consulting foresters prepared most or all plans in Connecticut (95%) and Hawaii (100%). NRCS personnel prepared all or most plans in Guam (100%) and Nevada (96%). Landowners prepared their own plans in Montana, but contributed only in 2 other states (Washington--20%, Wisconsin--1%).

Approximately 85% of the states ($\underline{n}$=46) reported having $\geq$1 minimum standard(s) or qualification(s) that must be met or satisfied by potential plan preparers before they can write and submit stewardship plans; the other 15% reported that they had no minimum standard(s) or qualification(s). Of those states with standards, most (92.3%) have established minimum education and/or knowledge criteria (Table 4). In Subregion 3, this was the only standard used. Only Montana required that a certification test be taken and passed as a qualification. Completion and submission of

Table 4. Minimum standards or qualifications that individuals must meet before being allowed to prepare and submit forest stewardship plans, reported by subregions.

Location	Standard or Qualification					
	Complete and submit a formal application	Take and pass a certification test	Meet minimum education and/ or knowledge criteria	Demonstrate experience with professional certificate or license	Training	Other
Subregion 1	0.0%[a]	0.0%	100.0%	33.3%	33.3%	33.3%
Subregion 2	16.7%	16.7%	83.3%	16.7%	16.7%	16.7%
Subregion 3	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
REGION 1 Mean	7.7%	7.7%	92.3%	15.4%	15.4%	15.4%
Subregion 4	28.6%	0.0%	85.7%	0.0.%	28.6%	14.3%
Subregion 5	63.6%	0.0%	100.0%	28.6%	28.6%	14.3%
REGION 2 Mean	28.6%	0.0%	92.9%	14.3%	28.6%	14.3%
Subregion 6	37.5%	0.0%	87.5%	37.5%	37.5%	0.0%
Subregion 7	75.0%	0.0%	100.0%	75.0%	50.0%	0.0%
REGION 3 Mean	50.0%	0.0%	91.7%	50.0%	41.7%	0.0%
OVERALL	28.2%	2.6%	92.3%	25.6%	28.2%	10.3%

[a] Percentage of states within subregions reporting use of the standard or qualification.

a formal application was used mainly in Subregions 5 (63.6%) and 7 (Southeast) (75%). Demonstration of experience via professional certificate or license was used more in Subregion 7 (75%) than in any other. Other standards or qualifications used by states included fulfilling continuing education requirements, submitting to review by a qualified preparer, meeting with a stewardship forester to discuss planning, demonstrating other plan preparation experience, or simply preparing a plan that met certain standards.

Stewardship Plan Preparation

The methods used by plan preparers to inventory the presence of critical natural resources, as stipulated by FSP guidelines, varied considerably (Table 5). Heavy reliance upon on-site inspections for resource inventories was evident in all regions and subregions; only in Subregion 2 did use of site inspection fall below 80% (soils) for any resource category. In contrast, using computer databases played a relatively minor role in resource inventory, except for threatened and endangered (T&E) species assessments. Individuals making these assessments relied on all available inventory options in >58% of the states. Maps were deemed important tools primarily for locating or identifying soils and water-related resources. Plan preparers in Subregions 1 and 4 made extensive use of all 4 inventory methods to assess historical and cultural, non-timber plants, and T&E species resources.

When asked how much of the information obtained during resource inventory actually was included in stewardship plans presented to landowners as stipulated by US Forest Service FSP guidelines, the responses of FSP Coordinators varied considerably depending upon resource category (Table 6). Information describing each of the 8 critical resources required by the FSP was included in $\geq$ 80% (the highest range provided as an option was 80-100%) of stewardship plans in only about 50% of the states ($\underline{n}$=39). Data about soils, timber, and wildlife were included most frequently

Table 5. Percentage of states within subregions reporting use of various assessment techniques to inventory critical resources as part of Forest Stewardship Plan preparation.

	INVENTORY ASSESSMENT OPTIONS			
RESOURCE	Site Inspection	Prior Record of Inventory	Maps	Computer Database
HISTORICAL AND CULTURAL INTERESTS				
Subregion 1	80.0	100.0	80.0	60.0
Subregion 2	85.7	57.1	57.1	14.3
Subregion 3	100.0	75.0	50.0	0.0
REGION 1	87.5	75.0	50.0	25.0
Subregion 4	100.0	57.1	57.1	57.1
Subregion 5	81.8	54.5	54.5	9.1
REGION 2	88.9	55.6	55.6	27.8
Subregion 6	100.0	25.0	50.0	0.0
Subregion 7	100.0	75.0	75.0	0.0
REGION 3	100.0	41.7	58.3	0.0
OVERALL	91.3	58.7	54.3	19.6
NON-TIMBER PLANT RESOURCES				
Subregion 1	100.0	80.0	80.0	60.0
Subregion 2	85.7	42.9	28.6	42.6
Subregion 3	100.0	25.0	25.0	25.0
REGION 1	93.8	50.0	43.8	43.8
Subregion 4	100.0	71.4	57.1	71.4
Subregion 5	90.9	72.7	63.6	54.5
REGION 2	94.4	72.2	61.1	61.1
Subregion 6	100.0	25.0	25.0	12.5
Subregion 7	100.0	50.0	25.0	0.0
REGION 3	100.0	33.3	25.0	8.3
OVERALL	95.7	54.3	45.7	41.3

Table 5. (continued).

RESOURCE	INVENTORY ASSESSMENT OPTIONS			
	Site Inspection	Prior Record of Inventory	Maps	Computer Database
RECREATIONAL AND ESTHETIC				
Subregion 1	100.0.0	20.0	60.0	0.0
Subregion 2	100.0	28.6	57.1	0.0
Subregion 3	100.0	25.0	25.0	0.0
REGION 1	100.0	25.0	50.0	0.0
Subregion 4	100.0	14.3	14.3	14.3
Subregion 5	100.0	45.5	36.4	9.1
REGION 2	100.0	33.3	27.8	11.1
Subregion 6	100.0	12.5	12.5	0.0
Subregion 7	100.0	50.0	25.0	0.0
REGION 3	100.0	25.0	16.7	0.0
OVERALL	100.0	28.3	32.6	4.3
SOILS				
Subregion 1	100.0	80.0	100.0	20.0
Subregion 2	57.1	71.4	100.0	14.3
Subregion 3	100.0	50.0	100.0	0.0
REGION 1	81.3	68.8	100.0	12.5
Subregion 4	100.0	57.1	85.7	14.3
Subregion 5	90.0.9	72.7	81.8	18.2
REGION 2	94.4	66.7	83.3	16.7
Subregion 6	87.5	50.0	87.5	25.0
Subregion 7	100.0	100.0	100.0	25.0
REGION 3	91.7	66.7	91.7	25.0
OVERALL	89.1	67.4	91.3	17.4

Table 5. (continued).

RESOURCE	INVENTORY ASSESSMENT OPTIONS			
	Site Inspection	Prior Record of Inventory	Maps	Computer Database
THREATENED AND ENDANGERED SPECIES				
Subregion 1	100.0	80.0	60.0	60.0
Subregion 2	85.7	42.9	42.9	42.9
Subregion 3	100.0	75.0	50.0	25.0
REGION 1	93.8	62.5	50.0	43.8
Subregion 4	100.0	71.4	71.4	71.4
Subregion 5	90.9	72.7	72.7	81.8
REGION 2	94.4	72.7	72.2	77.8
Subregion 6	100.0	62.5	62.5	37.5
Subregion 7	75.0	100.0	75.0	75.0
REGION 3	91.7	75.0	66.7	50.0
OVERALL	93.5	69.6	63.0	58.7
TIMBER				
Subregion 1	100.0	60.0	60.0	40.0
Subregion 2	100.0	57.1	71.4	14.3
Subregion 3	100.0	75.0	50.0	0.0
REGION 1	100.0	62.5	62.5	18.8
Subregion 4	100.0	71.4	71.4	28.6
Subregion 5	100.0	72.7	45.5	9.1
REGION 2	100.0	72.2	55.6	16.7
Subregion 6	100.0	62.5	62.5	0.0
Subregion 7	100.0	75.0	100.0	0.0
REGION 3	100.0	66.7	75.0	0.0
OVERALL	100.0	67.4	63.0	13.0

Table 5. (continued).

RESOURCE	INVENTORY ASSESSMENT OPTIONS			
	Site Inspection	Prior Record of Inventory	Maps	Computer Database
WATER AND WETLANDS				
Subregion 1	100.0	40.0	100.0	20.0
Subregion 2	100.0	42.9	85.7	0.0
Subregion 3	100.0	25.0	75.0	0.0
REGION 1	100.0	37.5	87.5	6.3
Subregion 4	100.0	57.1	71.4	14.3
Subregion 5	100.0	72.7	81.8	27.3
REGION 2	100.0	66.7	77.8	22.2
Subregion 6	100.0	50.0	75.0	25.0
Subregion 7	100.0	100.0	100.0	0.0
REGION 3	100.0	66.7	83.3	16.7
OVERALL	100.0	56.5	82.6	15.2
WILDLIFE AND FISHERIES				
Subregion 1	100.0	80.0	60.0	40.0
Subregion 2	100.0	57.1	28.6	0.0
Subregion 3	100.0	75.0	25.0	0.0
REGION 1	100.0	68.8	37.5	12.5
Subregion 4	100.0	57.1	42.9	14.3
Subregion 5	100.0	45.5	54.5	18.2
REGION 2	100.0	50.0	50.0	16.7
Subregion 6	100.0	50.0	50.0	12.5
Subregion 7	100.0	75.0	75.0	0.0
REGION 3	100.0	58.3	58.3	8.3
OVERALL	100.0	58.7	47.8	13.0

Table 6. Percentage of states within subregions reporting the inclusion of descriptive materials about detected natural resources and the extent to which such information appears in the Forest Stewardship Plans prepared in that state.

	PERCENT OF PLANS CONTAINING DESCRIPTIVE INFORMATION ABOUT RESOURCES				
RESOURCE	0-20%	21-40%	41-60%	61-80%	81-100%
HISTORICAL AND CULTURAL					
Subregion 1	40.0	20.0	0.0	0.0	40.0
Subregion 2	28.6	14.3	0.0	14.3	42.9
Subregion 3	33.3	0.0	0.0	0.0	66.7
REGION 1	33.3	13.3	0.0	6.7	46.7
Subregion 4	20.0	0.0	0.0	20.0	60.0
Subregion 5	50.0	0.0	0.0	0.0	50.0
REGION 2	38.5	0.0	0.0	7.7	53.8
Subregion 6	62.5	0.0	0.0	0.0	37.5
Subregion 7	0.0	0.0	33.3	0.0	66.7
REGION 3	45.5	0.0	9.1	0.0	45.5
OVERALL	38.5	5.1	2.6	5.1	48.7
NON-TIMBER PLANTS					
Subregion 1	20.0	0.0	0.0	20.0	60.0
Subregion 2	28.6	0.0	0.0	14.3	57.1
Subregion 3	0.0	33.3	0.0	0.0	66.7
REGION 1	20.0	6.7	0.0	13.3	60.0
Subregion 4	0.0	20.0	20.0	0.0	60.0
Subregion 5	0.0	37.5	0.0	12.5	50.0
REGION 2	0.0	30.8	7.7	7.7	53.8
Subregion 6	37.5	25.0	12.5	12.5	12.5
Subregion 7	0.0	0.0	33.3	0.0	66.7
REGION 3	27.3	18.2	18.2	9.1	27.3
OVERALL	15.4	17.9	7.7	10.3	48.7

Table 6. (continued).

RESOURCE	PERCENT OF PLANS CONTAINING DESCRIPTIVE INFORMATION ABOUT RESOURCES				
	0-20%	21-40%	41-60%	61-80%	81-100%
RECREATIONAL AND ESTHETIC					
Subregion 1	20.0	0.0	0.0	40.0	40.0
Subregion 2	14.3	0.0	14.3	14.3	57.1
Subregion 3	0.0	33.3	0.0	0.0	66.7
REGION 1	13.3	6.7	6.7	20.0	53.3
Subregion 4	20.0	20.0	0.0	0.0	60.0
Subregion 5	0.0	12.5	12.5	12.5	62.5
REGION 2	7.7	15.4	7.7	7.7	61.5
Subregion 6	25	0.0	25	25	25
Subregion 7	0.0	0.0	0.0	0.0	100.0
REGION 3	18.2	0.0	18.2	18.2	45.5
OVERALL	12.8	7.7	10.3	15.4	53.8
SOILS					
Subregion 1	20.0	0.0	0.0	0.0	80.0
Subregion 2	14.3	0.0	0.0	0.0	85.7
Subregion 3	0.0	0.0	0.0	0.0	100.0
REGION 1	13.3	0.0	0.0	0.0	86.7
Subregion 4	0.0	0.0	0.0	20.0	80.0
Subregion 5	0.0	0.0	0.0	0.0	100.0
REGION 2	0.0	0.0	0.0	7.7	92.3
Subregion 6	0.0	12.5	0.0	12.5	75
Subregion 7	0.0	0.0	0.0	0.0	100.0
REGION 3	0.0	9.1	0.0	9.1	81.8
OVERALL	5.1	2.6	0.0	5.1	87.2

Table 6. (continued).

RESOURCE	PERCENT OF PLANS CONTAINING DESCRIPTIVE INFORMATION ABOUT RESOURCES				
	0-20%	21-40%	41-60%	61-80%	81-100%
THREATENED AND ENDANGERED SPECIES					
Subregion 1	20.0	0.0	20.0	0.0	60.0
Subregion 2	28.6	0.0	14.3	0.0	57.1
Subregion 3	0.0	33.3	0.0	0.0	66.7
REGION 1	20.0	6.7	13.3	0.0	60.0
Subregion 4	0.0	20.0	40.0	0.0	40.0
Subregion 5	37.5	12.5	0.0	0.0	50.0
REGION 2	23.1	15.4	15.4	0.0	46.2
Subregion 6	37.5	0.0	0.0	0.0	62.5
Subregion 7	0.0	0.0	0.0	33.3	66.7
REGION 3	27.3	0.0	0.0	9.1	63.6
OVERALL	23.1	7.7	10.3	2.6	56.4
TIMBER					
Subregion 1	20.0	0.0	0.0	20.0	60.0
Subregion 2	0.0	0.0	0.0	14.3	85.7
Subregion 3	0.0	0.0	0.0	33.3	66.7
REGION 1	6.7	0.0	0.0	20.0	73.3
Subregion 4	0.0	0.0	0.0	0.0	100.0
Subregion 5	0.0	12.5	0.0	0.0	87.5
REGION 2	0.0	7.7	0.0	0.0	92.3
Subregion 6	0.0	0.0	0.0	0.0	100.0
Subregion 7	0.0	0.0	0.0	0.0	100.0
REGION 3	0.0	0.0	0.0	0.0	100.0
OVERALL	2.6	2.6	0.0	7.7	87.2

Table 6. (continued).

RESOURCE	PERCENT OF PLANS CONTAINING DESCRIPTIVE INFORMATION ABOUT RESOURCES				
	0-20%	21-40%	41-60%	61-80%	81-100%
WATER AND WETLANDS					
Subregion 1	20.0	0.0	20.0	20.0	40.0
Subregion 2	0.0	0.0	14.3	0.0	85.7
Subregion 3	0.0	0.0	33.3	33.3	33.3
REGION 1	6.7	0.0	20.0	13.3	60.0
Subregion 4	0.0	0.0	20.0	40.0	40.0
Subregion 5	0.0	0.0	12.5	25.0	62.5
REGION 2	0.0	7.7	0.0	0.0	92.3
Subregion 6	12.5	0.0	12.5	0.0	75.0
Subregion 7	0.0	0.0	0.0	0.0	100.0
REGION 3	0.0	0.0	0.0	0.0	100.0
OVERALL	5.1	0.0	15.4	15.4	64.1
WILDLIFE AND FISHERIES					
Subregion 1	20.0	0.0	0.0	40.0	40.0
Subregion 2	0.0	14.3	14.3	0.0	71.4
Subregion 3	0.0	0.0	0.0	0.0	100.0
REGION 1	6.7	6.7	6.7	13.3	66.7
Subregion 4	0.0	0.0	0.0	0.0	100.0
Subregion 5	0.0	0.0	0.0	25.0	75.0
REGION 2	0.0	0.0	0.0	15.4	84.6
Subregion 6	0.0	0.0	0.0	12.5	87.5
Subregion 7	0.0	0.0	0.0	0.0	100.0
REGION 3	0.0	0.0	0.0	9.1	90.9
OVERALL	2.6	2.6	2.6	12.8	79.5

(included in $\geq$ 80% of plans in 87.2%, 87.2%, and 79.5% of the states respectively). Subregion 3 included information in $\geq$80% of plans for $\geq$65% of states for all resources except water and wetlands. Including historical and cultural resources data in stewardship plans appeared to be "all or none" in that <38.5% of the states included such information in <20% of their plans whereas 48.7% of the states included this information in $\geq$80% of their plans. Subregions 3 and 7 lead the way as 66.7% of the states in these areas included historical and cultural information in $\geq$80% of stewardship plans they prepared. Data about non-timber plant resources were included in $\geq$80% of stewardship plans prepared in approximately 60% of the states in each subregion, except Subregion 6 (South Central) where only 25% of the states included such information in $\geq$60% of their stewardship plans. Recreational and esthetic resource information was included most often in Subregion 7 (in $\geq$80% of plans in all of its states) and Subregion 6 least often (in $\geq$80% of plans in only 25% of its states). Regionally, T&E species information was included more often in the West and South than in the North. In Subregion 4, only 40% of the states included T&E species information in $\geq$80% of their stewardship plans. In Subregion 5, 50% of the states included T&E information in <40% of their stewardship plans. Timber resource information was included in $\geq$60% of plans in all states except in Subregions 1 (20% of the states included information in $\leq$20% of plans) and 5 (12.5% of the states included information in 21 - 40% of plans). Regionally, information about water and wetlands was included more often in plans prepared in the North and South than in those in the West. Wildlife and fisheries information was included in all states in the North and South in $\geq$60% of stewardship plans. The West also had a high frequency of wildlife and fisheries information inclusion (data appeared in $\geq$60% of stewardship plans in 80% of states). States that included inventory data on all resources in $\geq$80% of their stewardship plans were: Arizona, Delaware, Idaho, Indiana, Kentucky, Minnesota, Nevada, New Hampshire, Pennsylvania, South Carolina, Washington, and Wyoming.

Wildlife

When discussing management objectives, FSP Coordinators reported that landowners requested assistance more frequently about general wildlife improvements, such as generic requests for "more and better" wildlife or for improvements that allow the landowner to know that animals are present, rather than about wildlife enhancement for either non-consumptive or consumptive uses (Figure 1). Regionally, no differences were detected in how FSP Coordinators ranked landowners' general objective requests (K-W X^2= 0.726, df = 2, $\underline{P}$ = 0.696). However, rankings of consumptive and non-consumptive objectives varied significantly by region. FSP Coordinators reported that landowners requested consumptive use objectives more frequently in the South than in the North and, significantly so, in the West (K-W X^2= 7.546, df = 2, $\underline{P}$ = 0.023), whereas non-consumptive use objectives were requested more frequently in the West than in the North and, significantly so, in the South (K-W X^2= 6.760, df = 2, $\underline{P}$ = 0.034).

When asked about perceived needs of plan preparers in their state, 85% of FSP Coordinators believed that preparers needed help in addressing wildlife issues involved in the FSP. The perceived need for help for state foresters was deemed moderate in 64% of the states ($\underline{n}$ = 33) (Figure 2). State wildlife biologists and private consulting biologists had little or no perceived need for assistance in most states (42%, $\underline{n}$ = 23 and 36%, $\underline{n}$ = 20 respectively) (Figures 3 and 4). The perceived need for help for state wildlife biologists was slightly greater in Regions 1 (2.57, based on numeric conversion where strong = 1, moderate = 2, little = 3, and none = 4) and 3 (2.67) than in Region 2 (3.20). Private consulting biologists' perceived need for help was greater in Region 1 (2.20) than Region 2 (2.75) or 3 (3.14). A strong to moderate need for help was identified for private consulting foresters and industrial foresters in 83% and 72% of states ($\underline{n}$ = 32, $\underline{n}$ = 30 respectively) (Figures 5 and 6). FSP Coordinators in Region 3 reported a greater need for help for private consulting

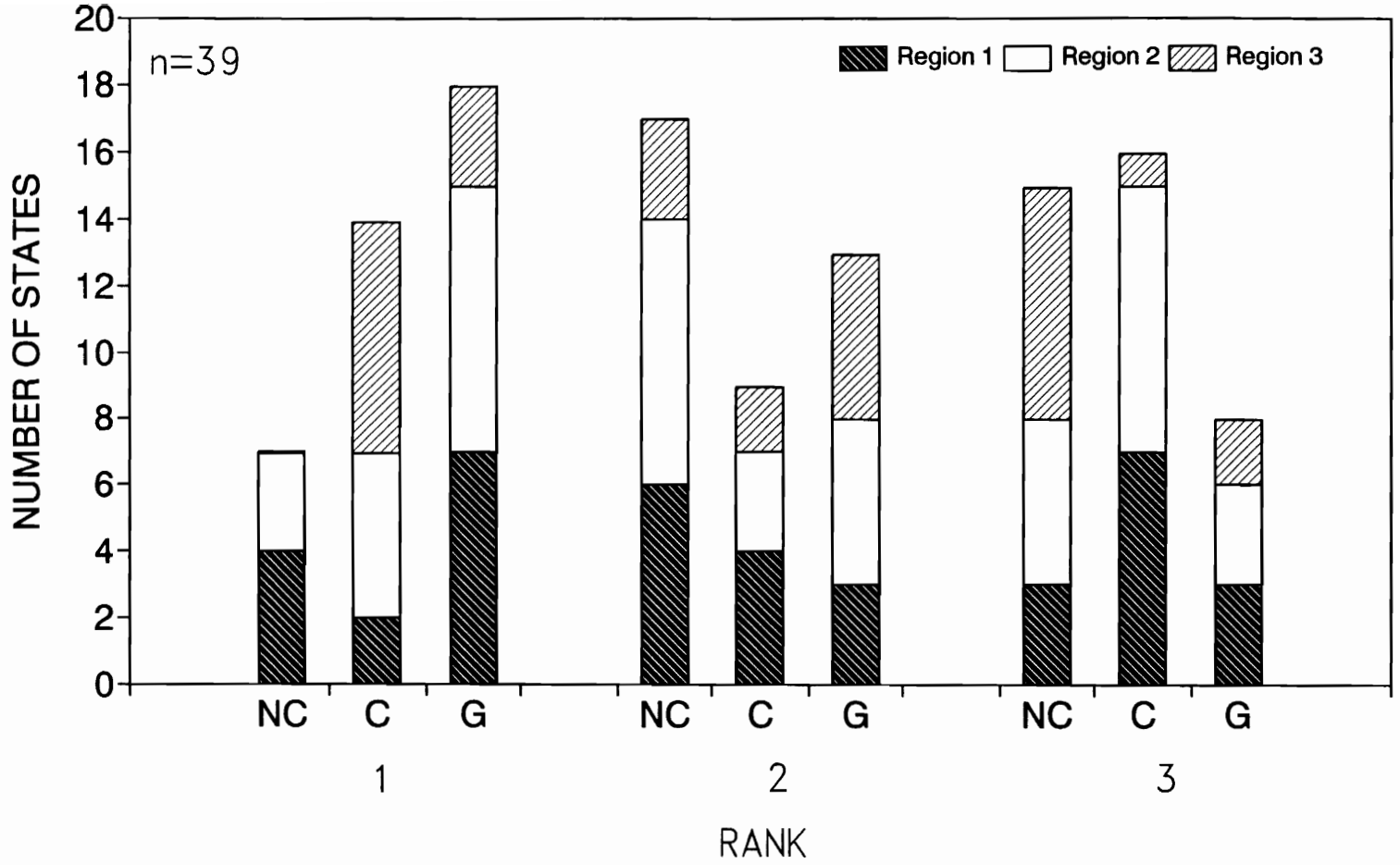

Figure 1. Ranking of landowner objectives regarding wildlife issues where 1 is highest priority and 3 is lowest priority (NC = non-consumptive, C = consumptive, and G = general).

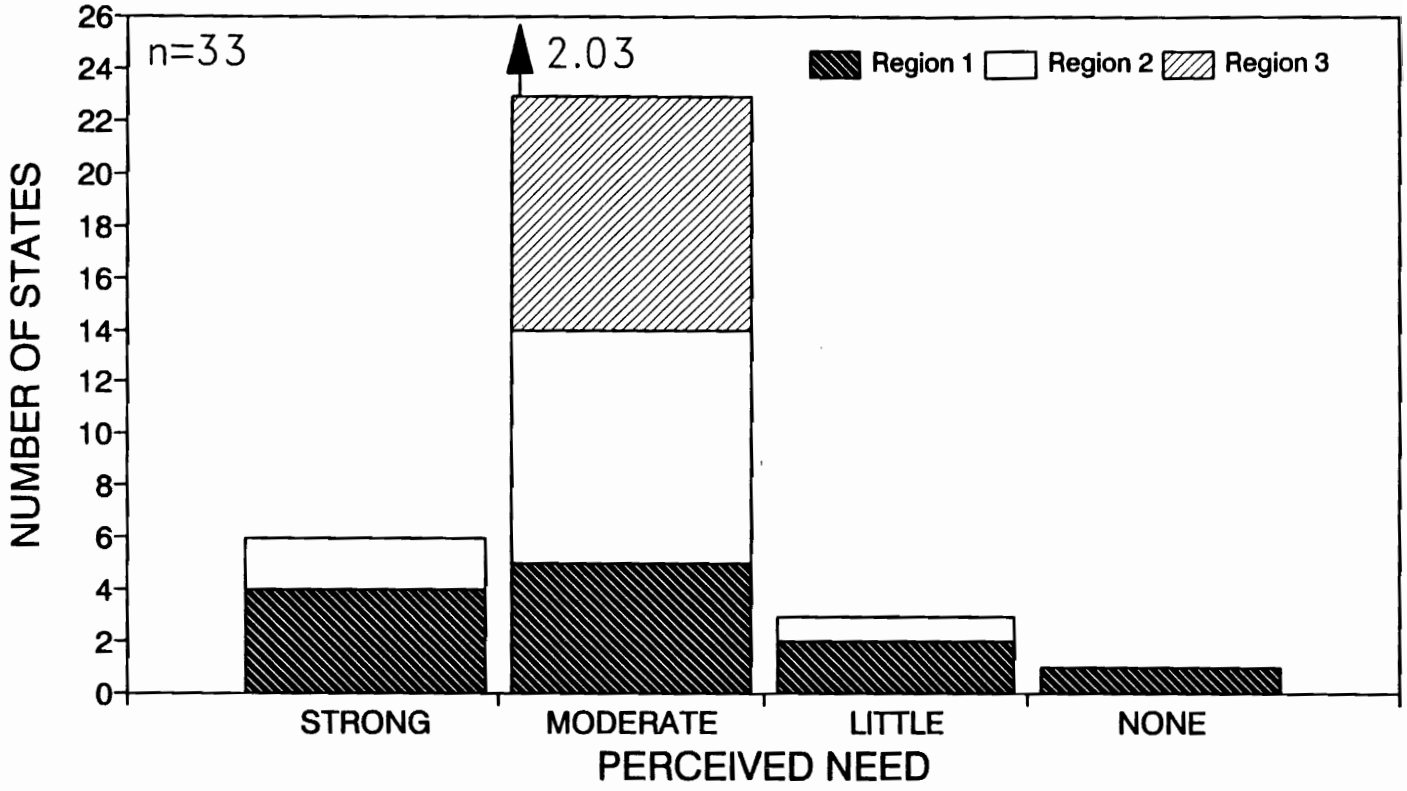

Figure 2. Perceived need for assistance among state foresters in addressing wildlife issues in stewardship planning, as reported by FSP Coordinators (arrow represents the national mean based on numeric conversion where strong = 1, moderate = 2, little = 3, and none = 4).

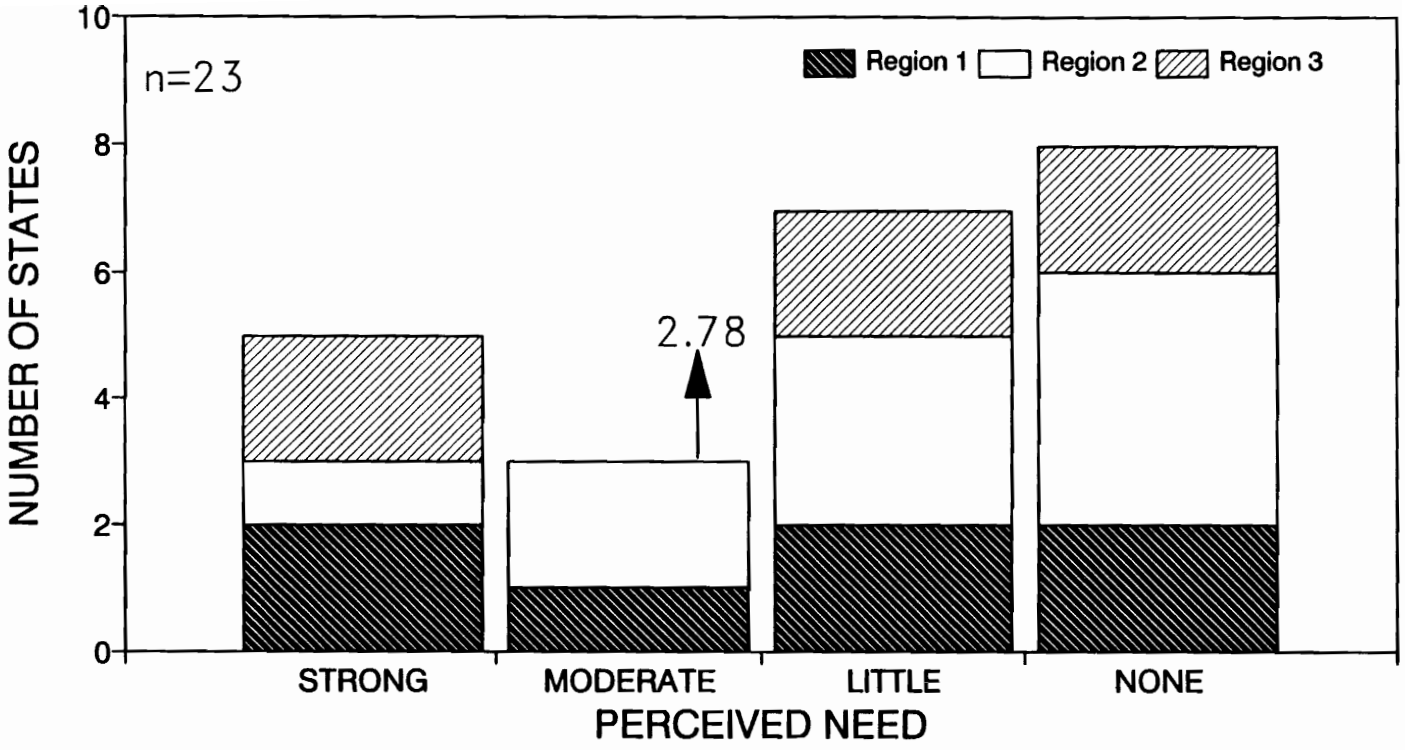

Figure 3. Perceived need for assistance among state wildlife biologists in addressing wildlife issues in stewardship planning, as reported by FSP Coordinators (arrow represents the national mean based on numeric conversion where strong = 1, moderate = 2, little = 3, and none = 4).

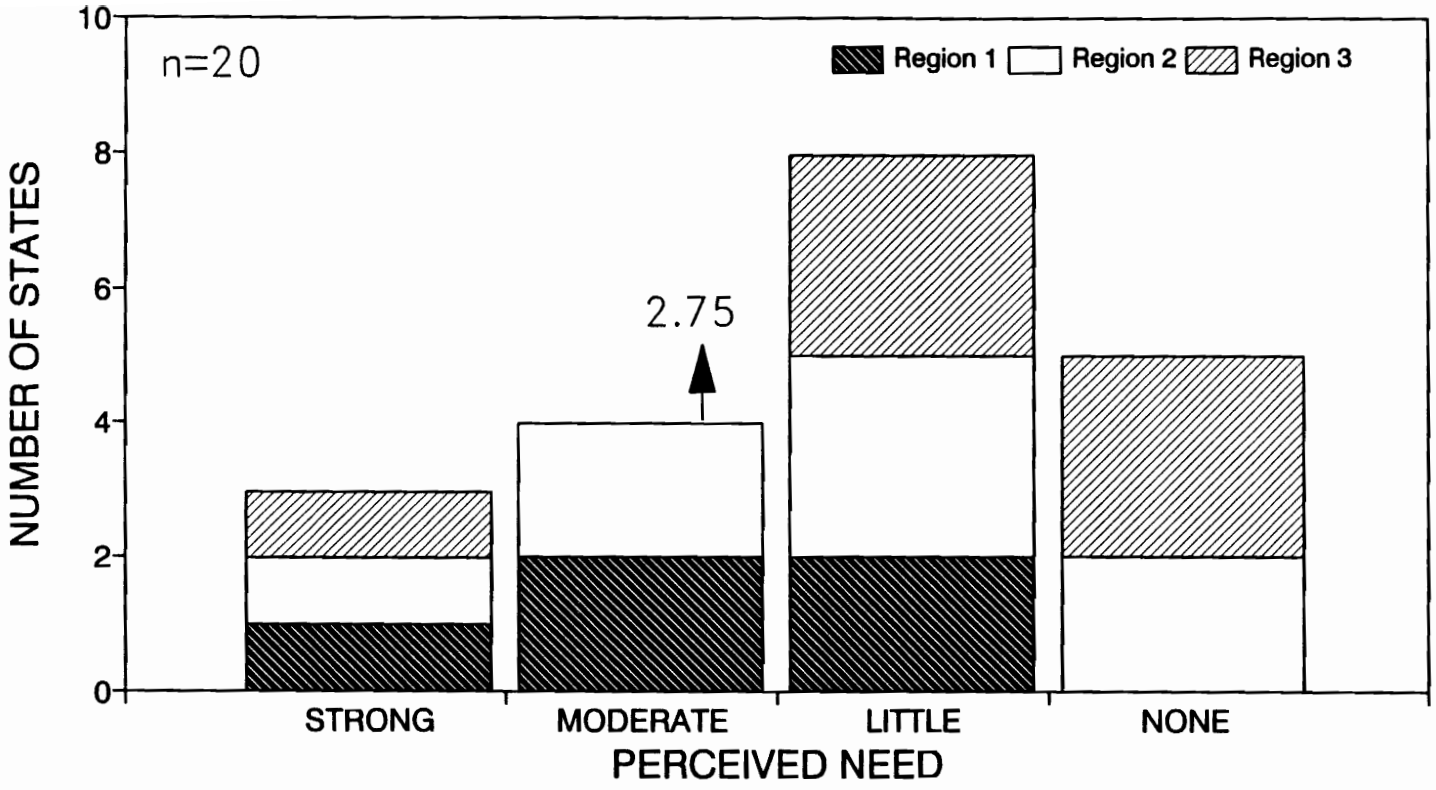

Figure 4. Perceived need for assistance among private consulting biologists in addressing wildlife issues in stewardship planning, as reported by FSP Coordinators (arrow represents the national mean based on numeric conversion where strong = 1, moderate = 2, little = 3, and none = 4).

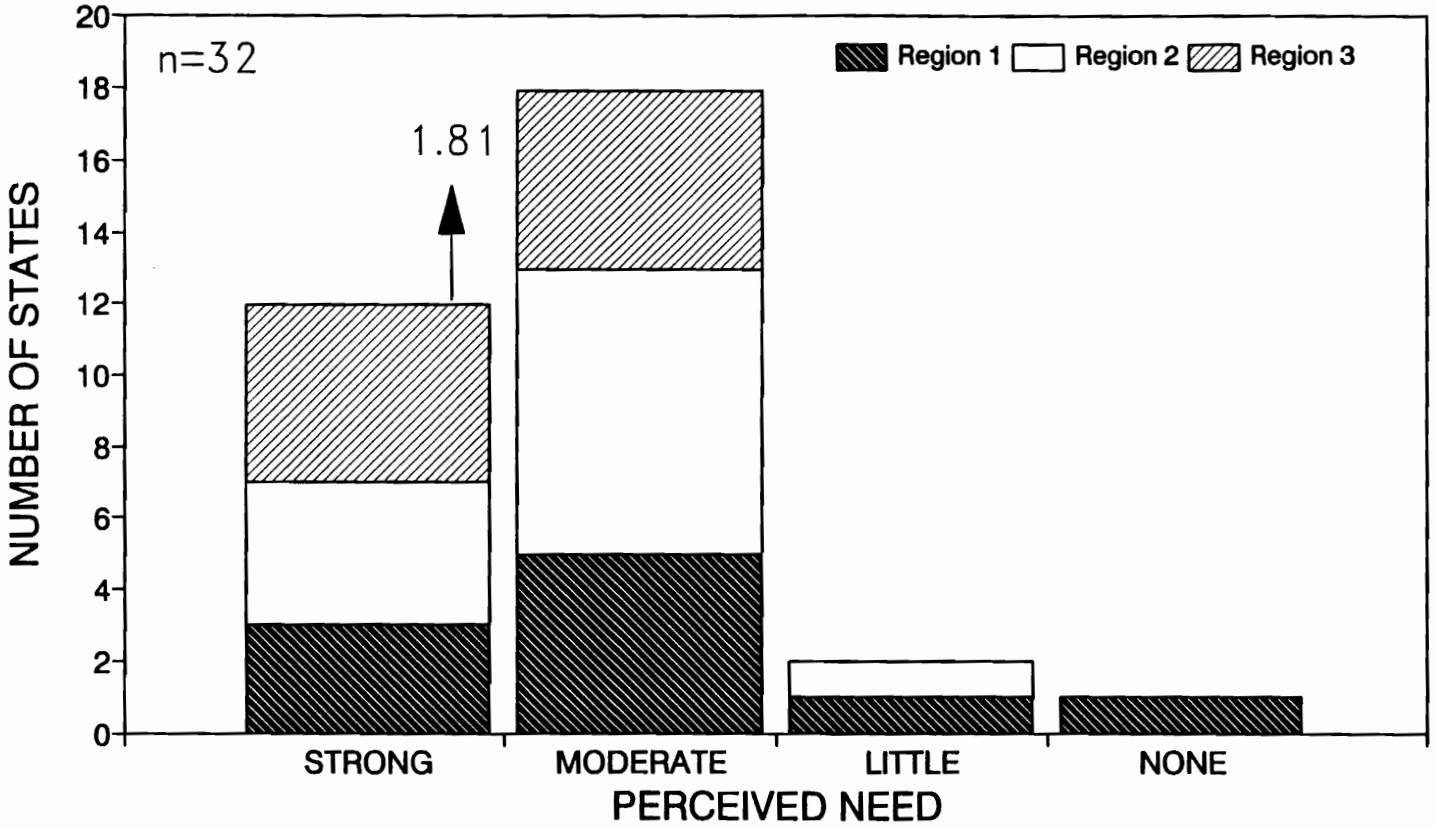

Figure 5. Perceived need for assistance among private consulting foresters in addressing wildlife issues in stewardship planning, as reported by FSP Coordinators (arrow represents the national mean based on numeric conversion where strong = 1, moderate = 2, little = 3, and none = 4).

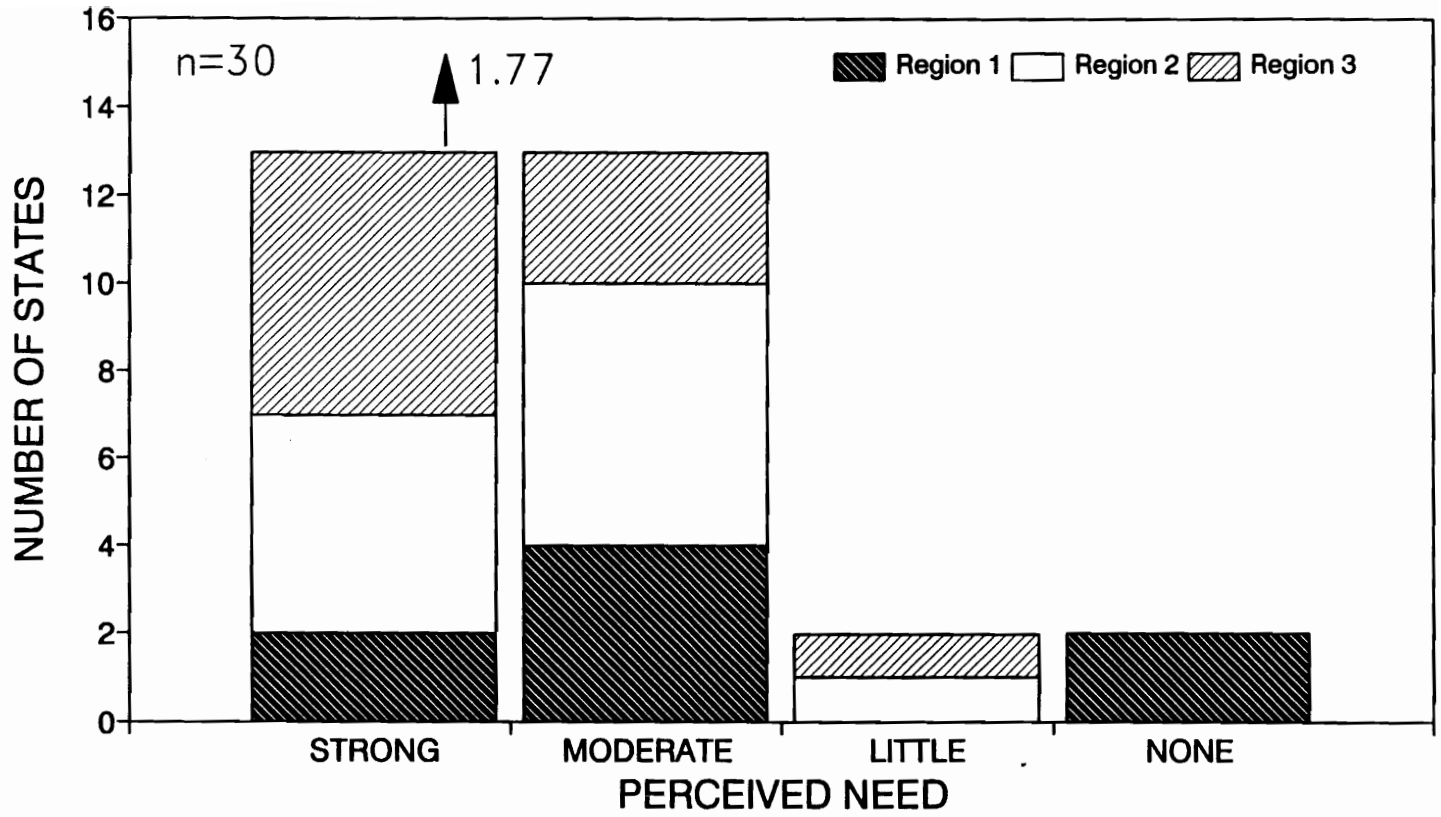

Figure 6. Perceived need for assistance among industrial foresters in addressing wildlife issues in stewardship planning, as reported by FSP Coordinators (arrow represents the national mean based on numeric conversion where stron = 1, moderate = 2, little = 3, and none = 4).

foresters (1.50) than Regions 2 (1.77) or 1 (2.00). FSP Coordinators' perception of industrial foresters' need for help was greater in Regions 2 (1.67) and 3 (1.50) than in Region 1 (2.25).

In 93% of the states ($\underline{n}$ = 46), stewardship plan preparers have sought outside assistance in addressing wildlife issues. FSP Coordinators identified the sources of assistance used by plan preparers in their states and these included: state agencies (95%), federal agencies (58%), university or cooperative extension services (63%), private environmental groups (e.g., National Wildlife Federation, Nature Conservancy, Wild Turkey Federation) (40%), private wildlife consultants (33%), professional organizations (e.g., Society of American Forester, The Wildlife Society) (16%), and Indian tribes (2%) (Figure 7). Regionally, federal agencies provided assistance least often in the South, whereas University or cooperative extension service personnel were relied upon least in the West. Private wildlife consultants were used most frequently in the South (50%). Private environmental groups provided assistance in only about 25% of the Southern states.

When asked if they could identify the frequency with which certain types of assistance were being sought by preparers of stewardship plans in their states, 85% of FSP Coordinators stated that they could (Figures 8-10). "In-the-field" assistance was sought frequently or very frequently in 35% of the states ($\underline{n}$ = 34). Basic wildlife knowledge and/or information was sought frequently or very frequently in 64% of the states ($\underline{n}$ = 33). Specific, technical, wildlife management recommendations were sought frequently or very frequently in 54% of the states ($\underline{n}$ = 34). Regionally, no differences were detected in the frequency with which these types of assistance were being requested (K-W X^2= 1.352, df = 2, $\underline{P}$ = 0.509; K-W X^2= 2.927, df = 2, $\underline{P}$ = 0.231; K-W X^2= 1.801, df = 2, $\underline{P}$ = 0.407, respectively).

Stewardship Coordinators also identified the relative frequency with which a variety of common wildlife management techniques and practices appeared in stewardship plans in their state as means to satisfy landowners' objectives (Figures 11-

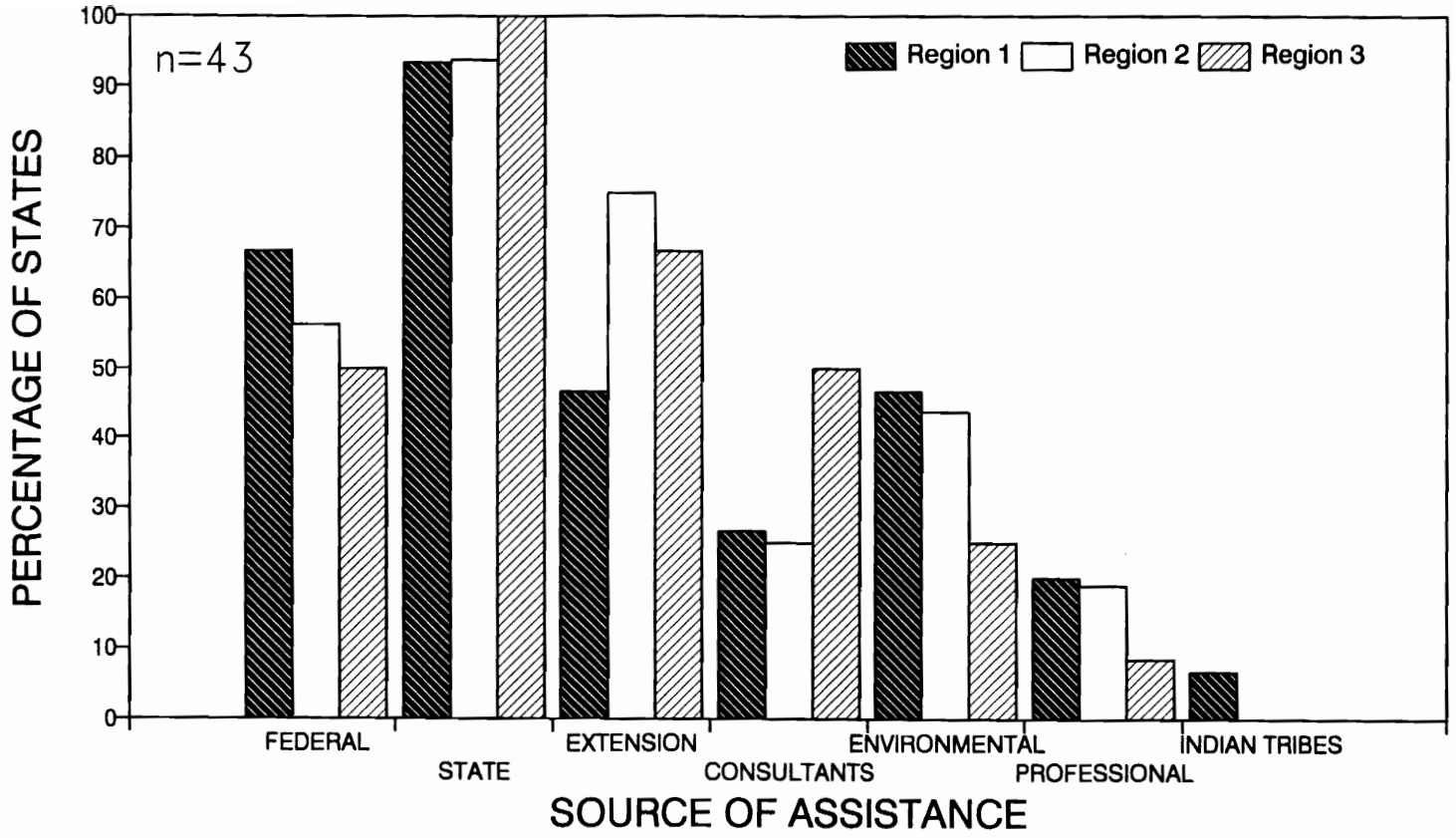

Figure 7. Sources of outside assistance on wildlife issues used by stewardship plan preparers, as reported by FSP Coordinators.

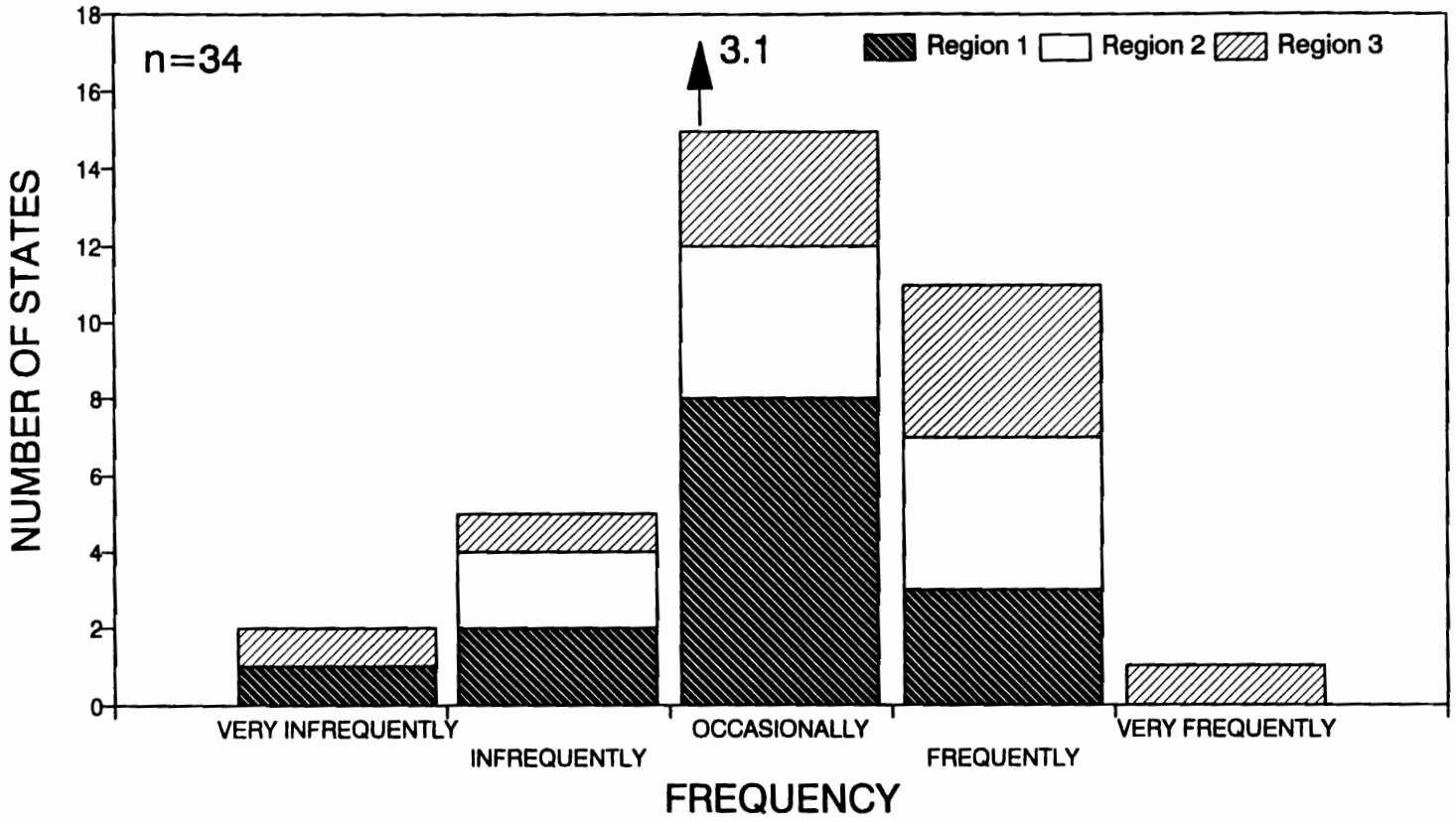

Figure 8. Frequency with which stewardship plan preparers sought field assistance, such as resource inventory and identification, from other sources, as reported by FSP Coordinators (arrow represents the national mean based on numeric conversion where very infrequently = 1, infrequently = 2, occasionally = 3, frequently = 4, and very frequently = 5).

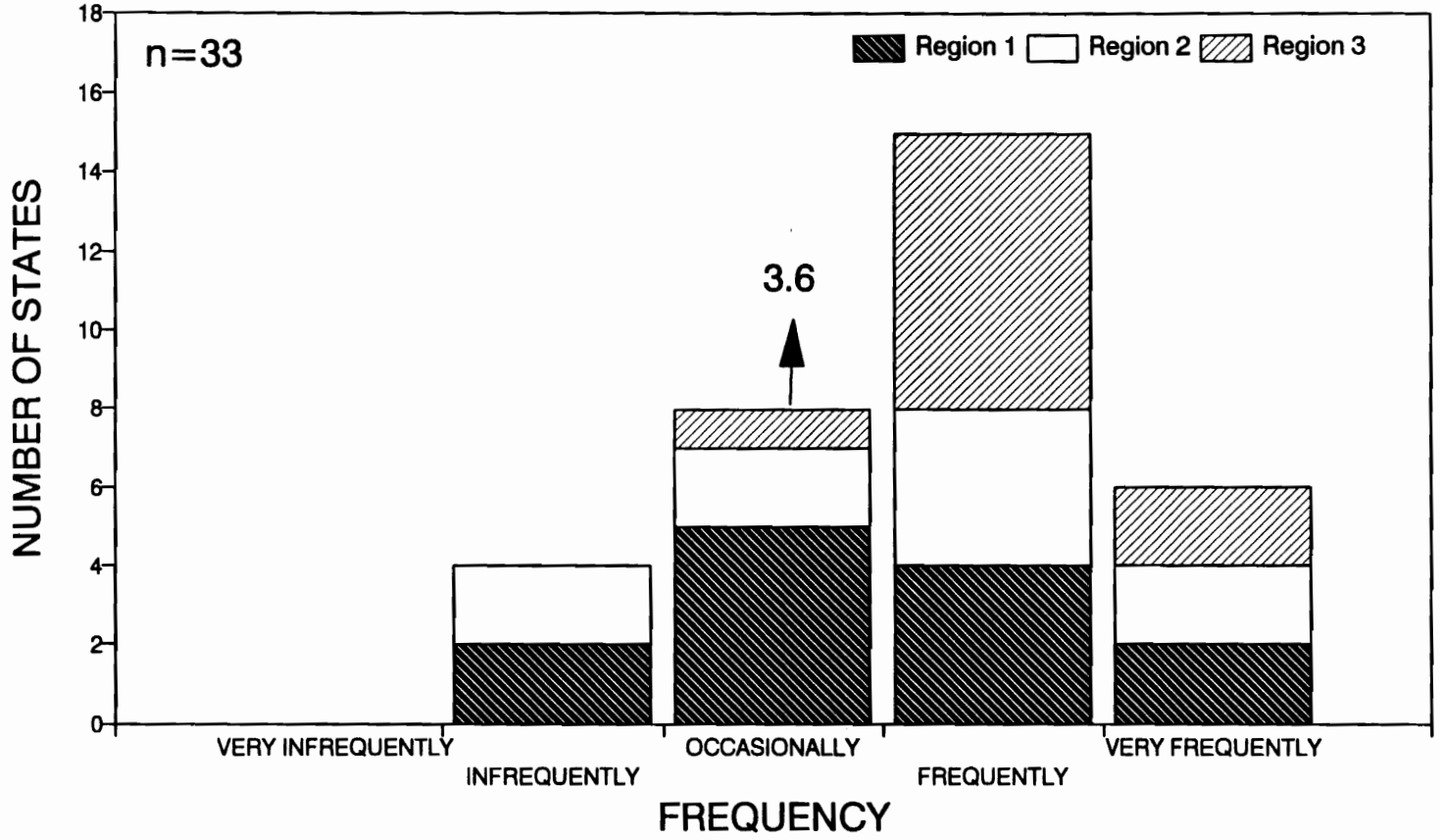

Figure 9. Frequency with which stewardship plan preparers sought help with basic wildlife knowledge and/or information, such as life history needs and requirements, from other sources, as reported by FSP Coordinators (arrow represents the national mean based on numeric conversion where very infrequently = 1, infrequently = 2, occasionally = 3, frequently = 4, and very frequently = 5).

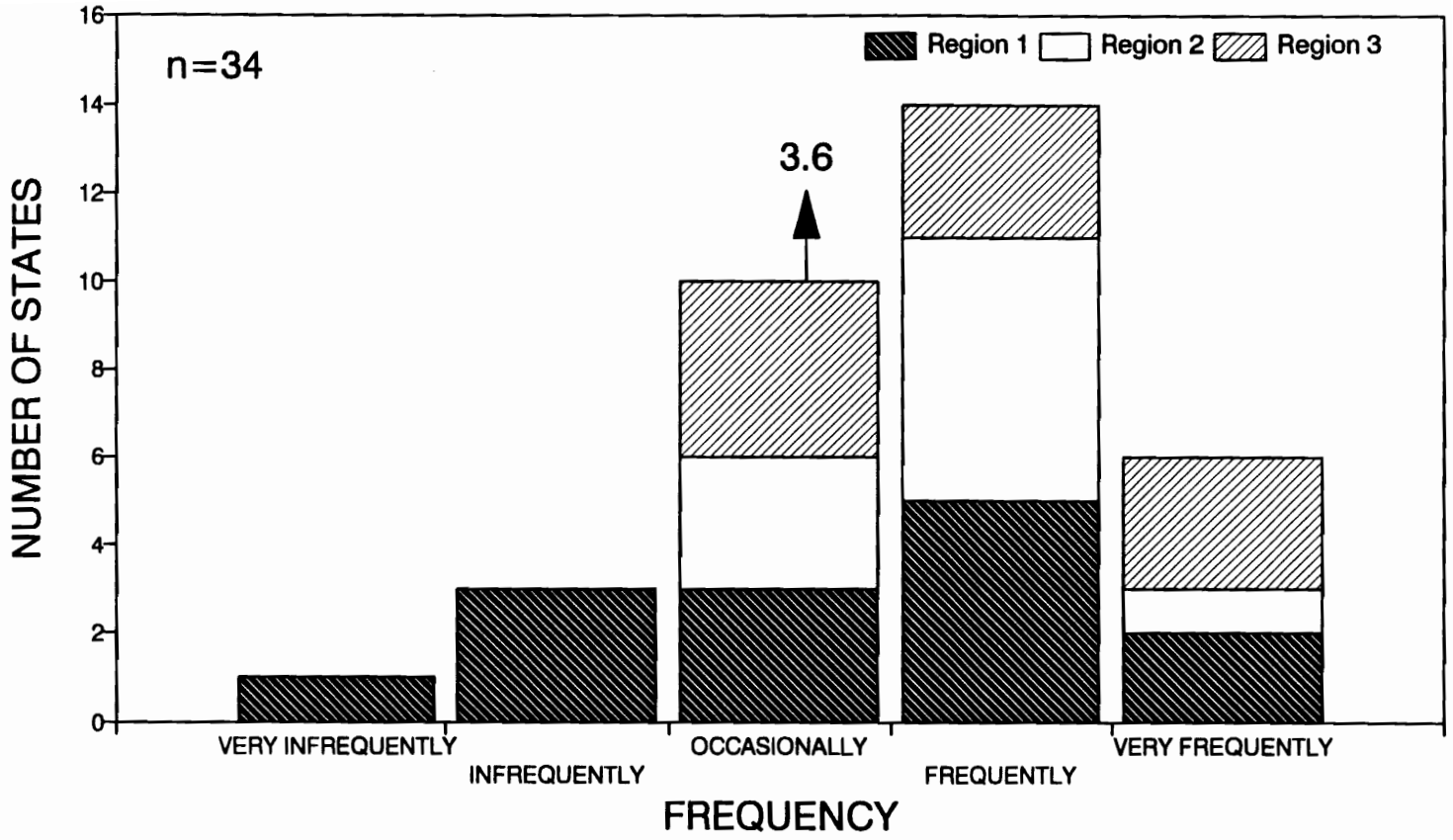

Figure 10. Frequency with which stewardship plan preparers sought wildlife assistance with specific technical management recommendations from other sources, as reported by FSP Coordinators (arrow represents the national mean based on numeric conversions where very infrequently = 1, infrequently = 2, occasionally = 3, frequently = 4, and very frequently = 5).

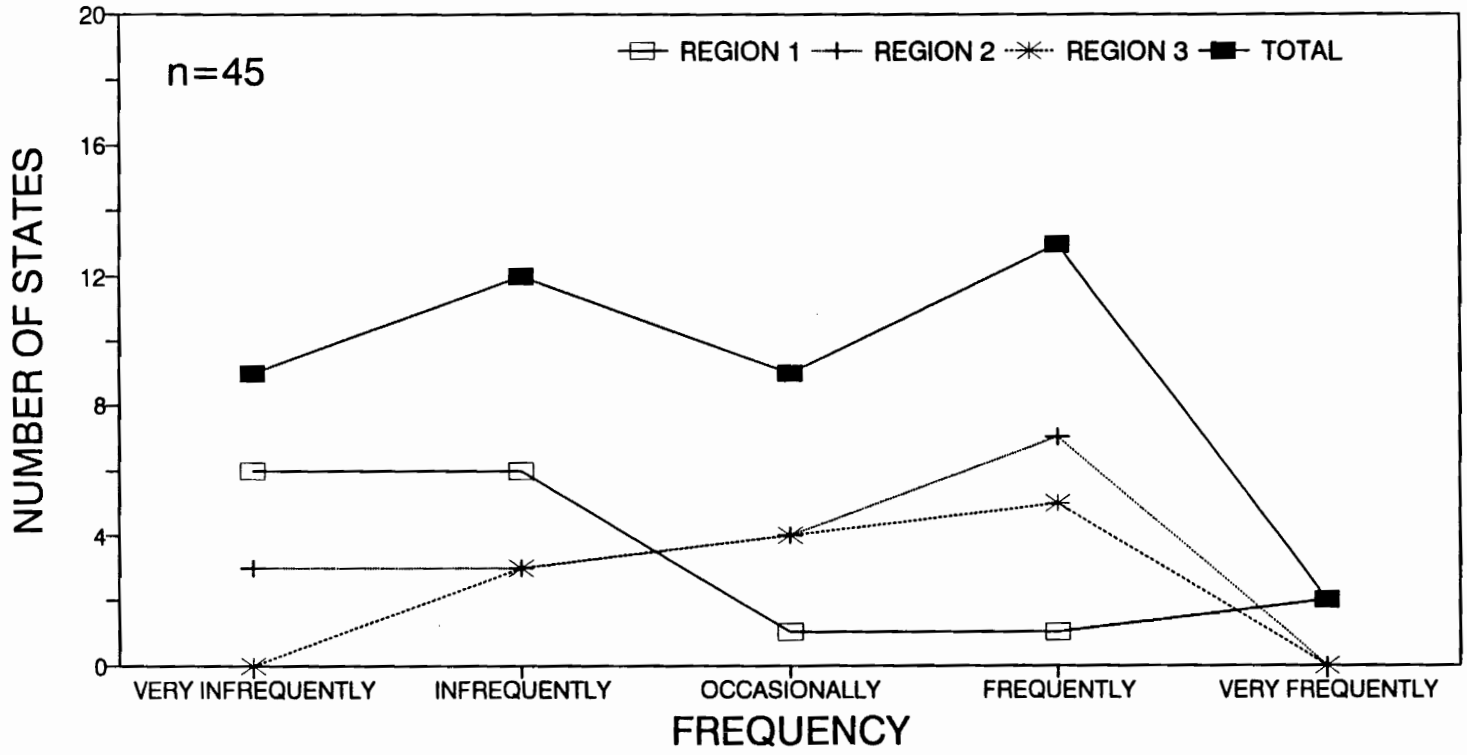

Figure 11. Frequency with which construction of nest boxes or platforms appeared as a wildlife management recommendation in forest stewardship plans, as reported by FSP Coordinators.

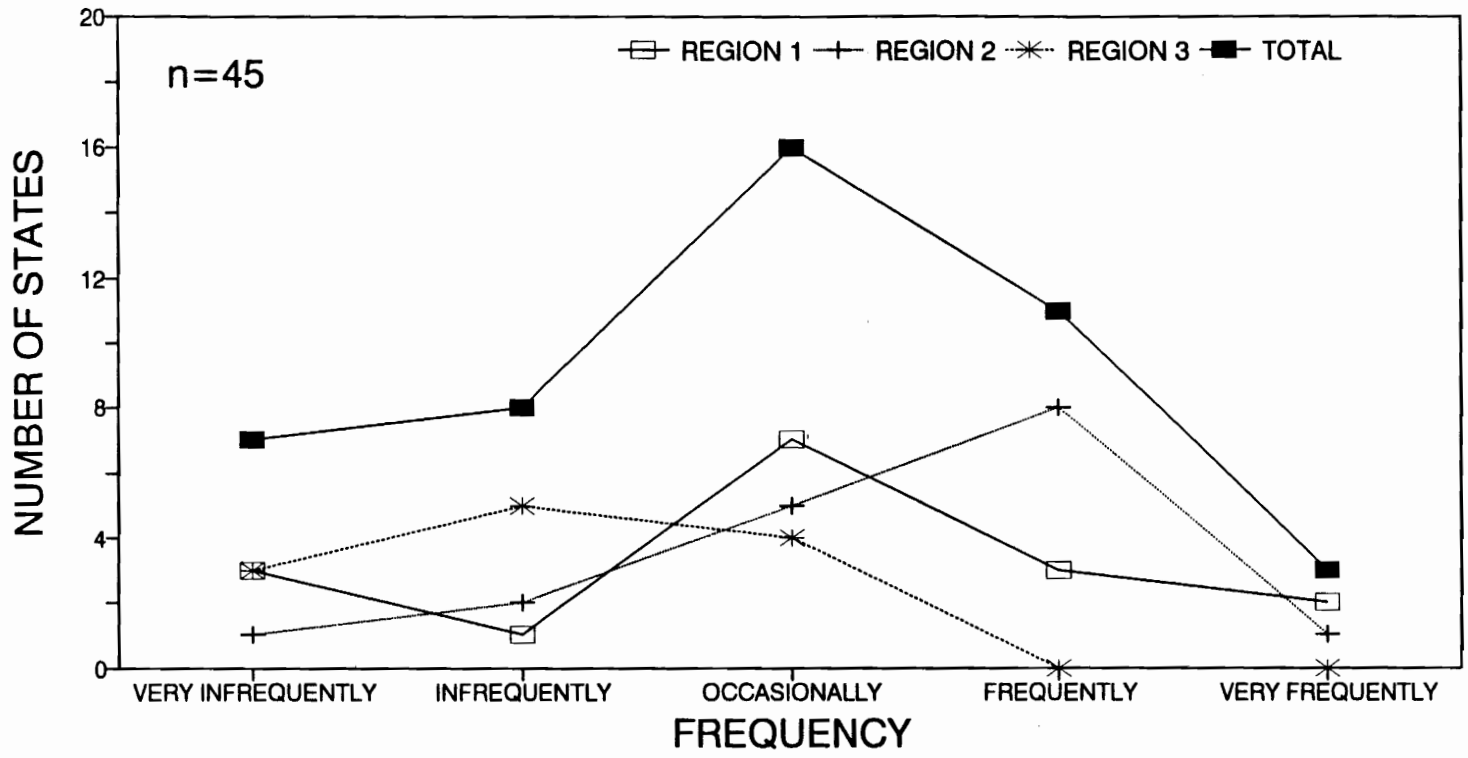

Figure 12. Frequency with which construction of brush piles appeared as a wildlife management recommendation in forest stewardship plans, as reported by FSP Coordinators.

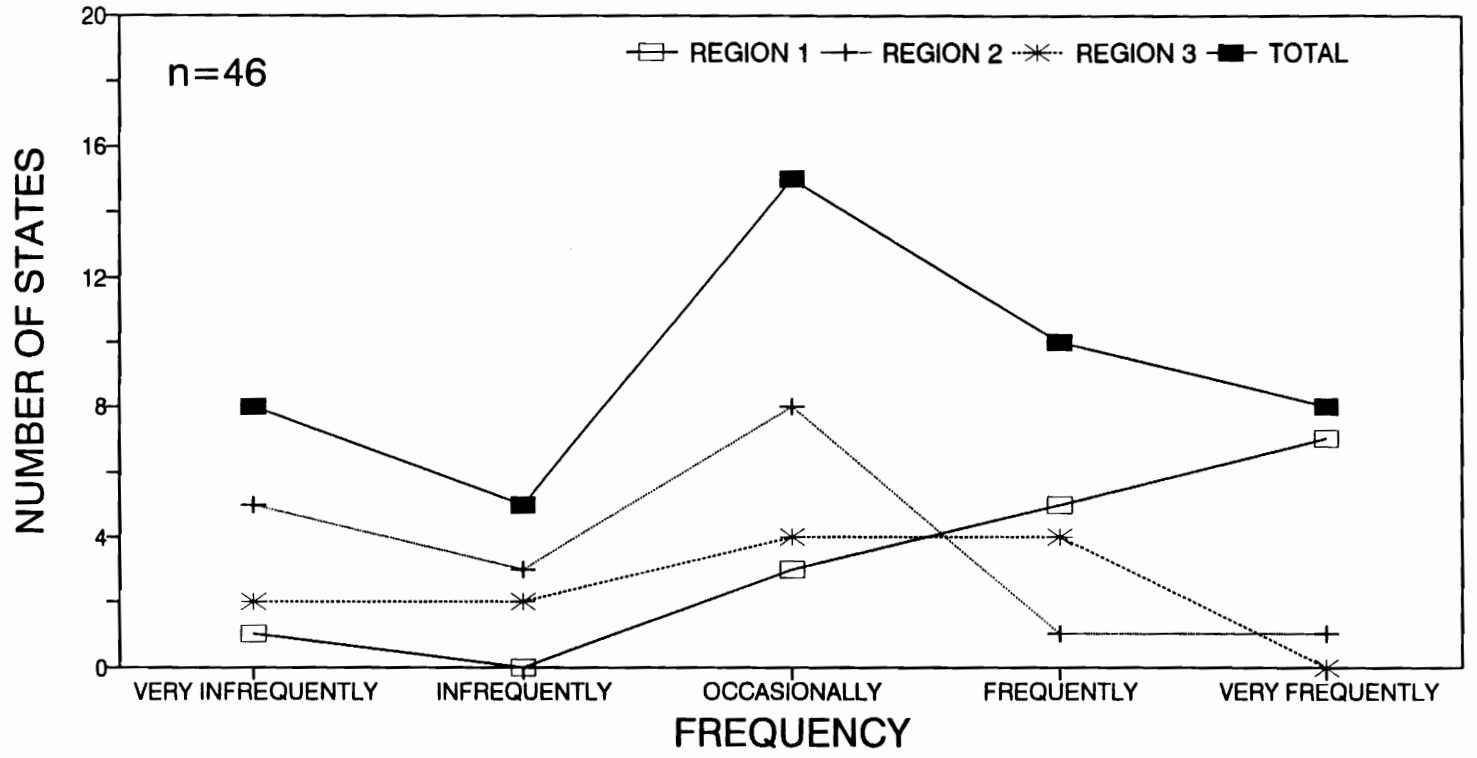

Figure 13. Frequency with which planting of hedgerows or windbreaks appeared as a wildlife management recommendation in forest stewardship plans, as reported by FSP Coordinators.

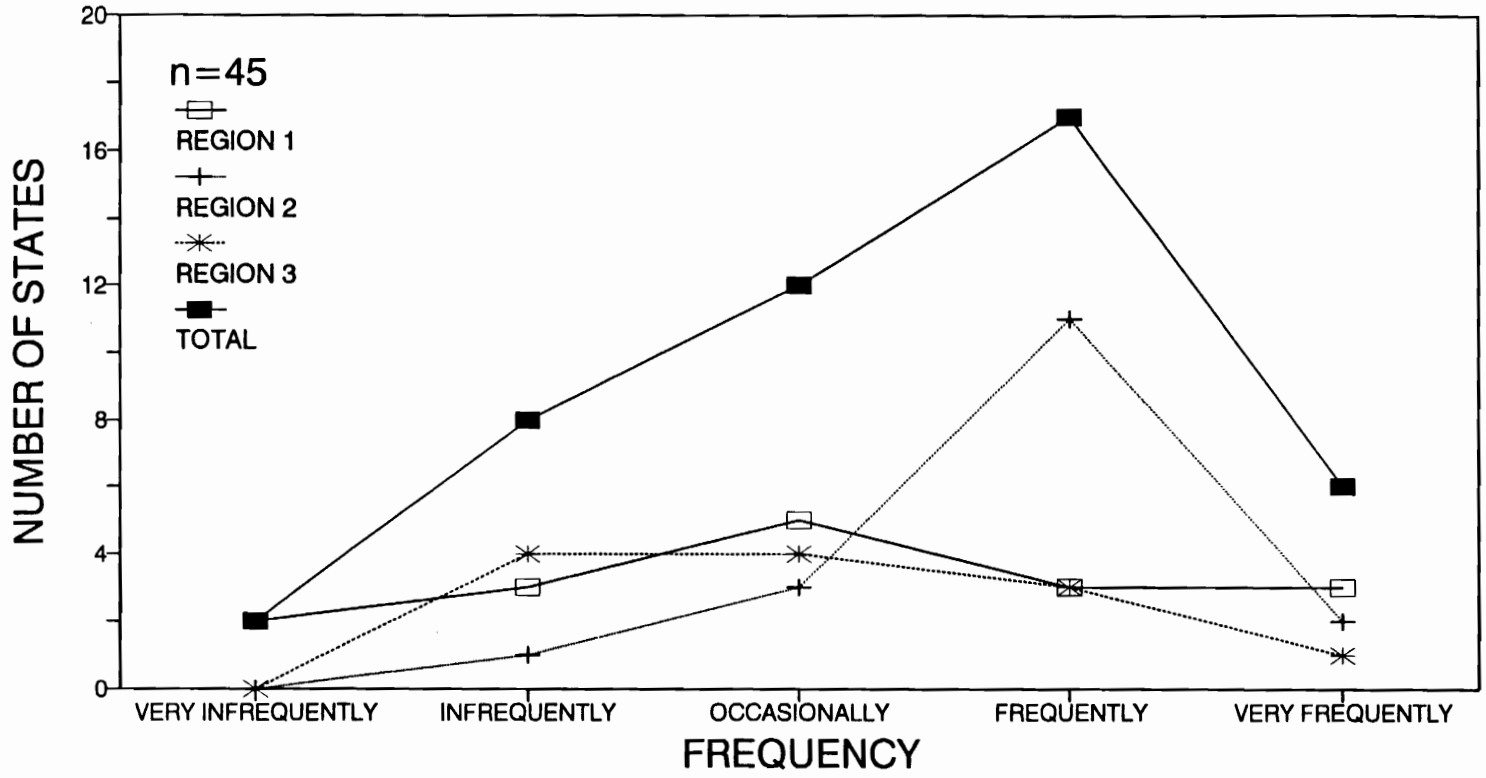

Figure 14. Frequency with which snag creation and/or management appeared as a wildlife management recommendation in forest stewardship plans, as reported by FSP Coordinators.

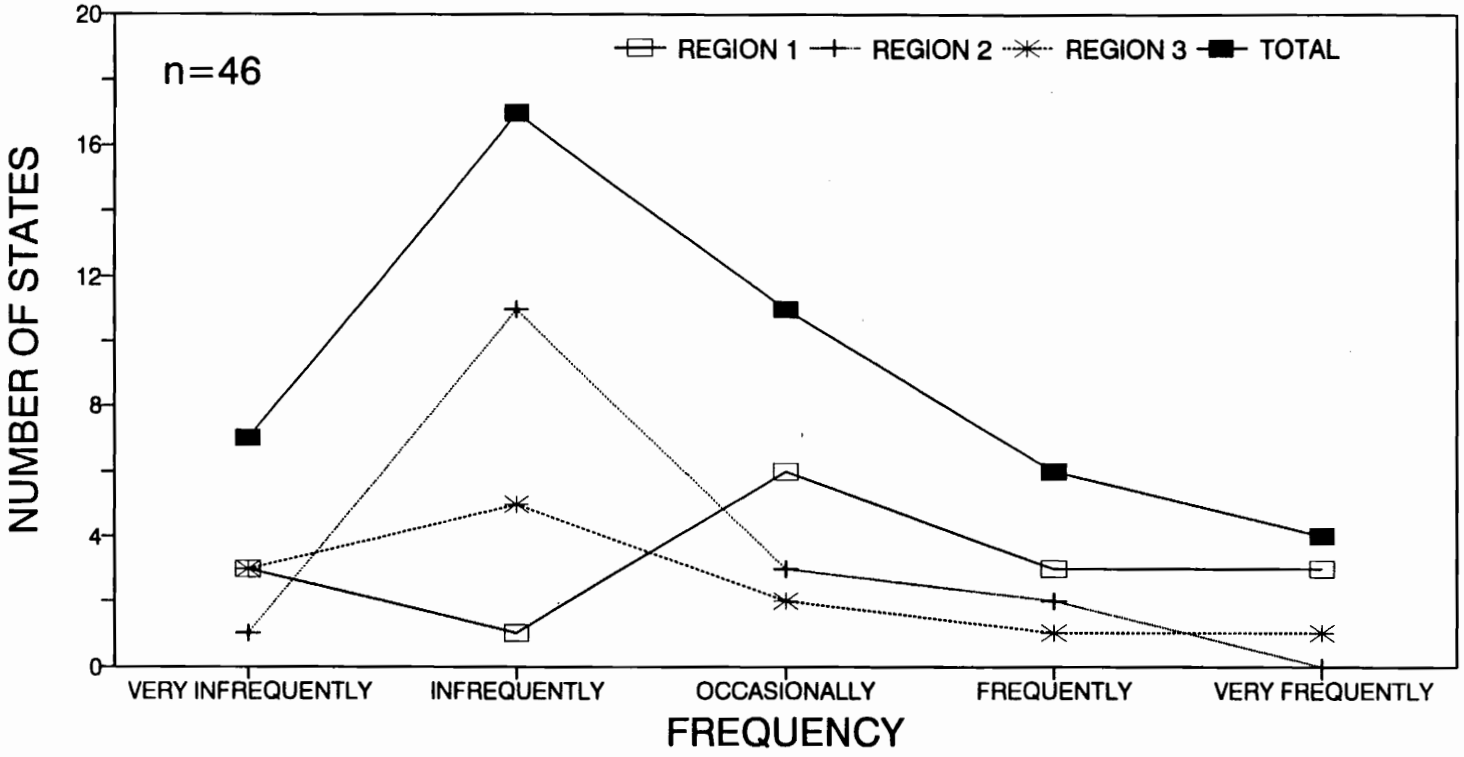

Figure 15. Frequency with which dead or downed wood management appeared as a wildlife management recommendation in forest stewardship plans, as reported by FSP Coordinators.

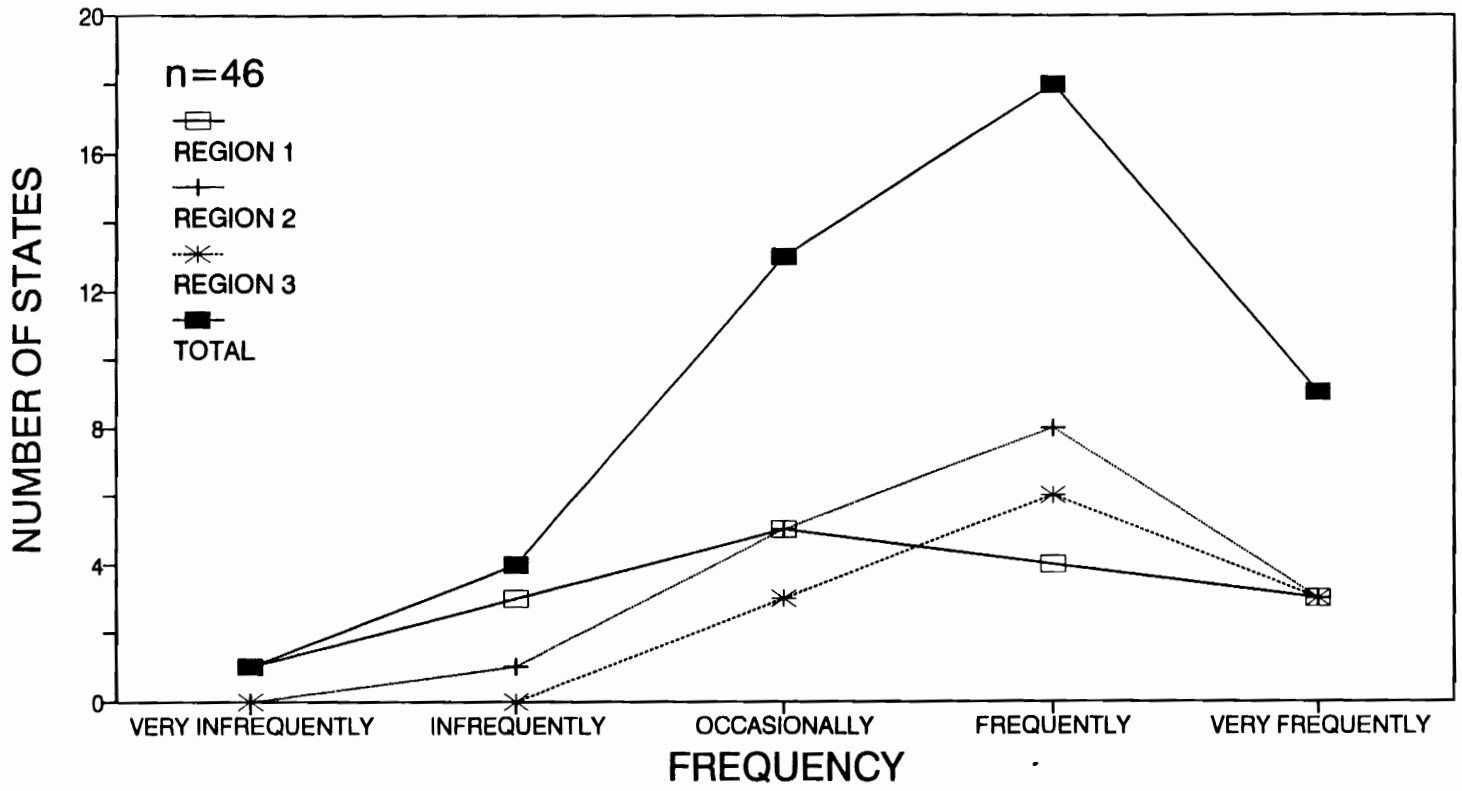

Figure 16. Frequency with which creation of edge appeared as a wildlife management recommendation in forest stewardship plans, as reported by FSP Coordinators.

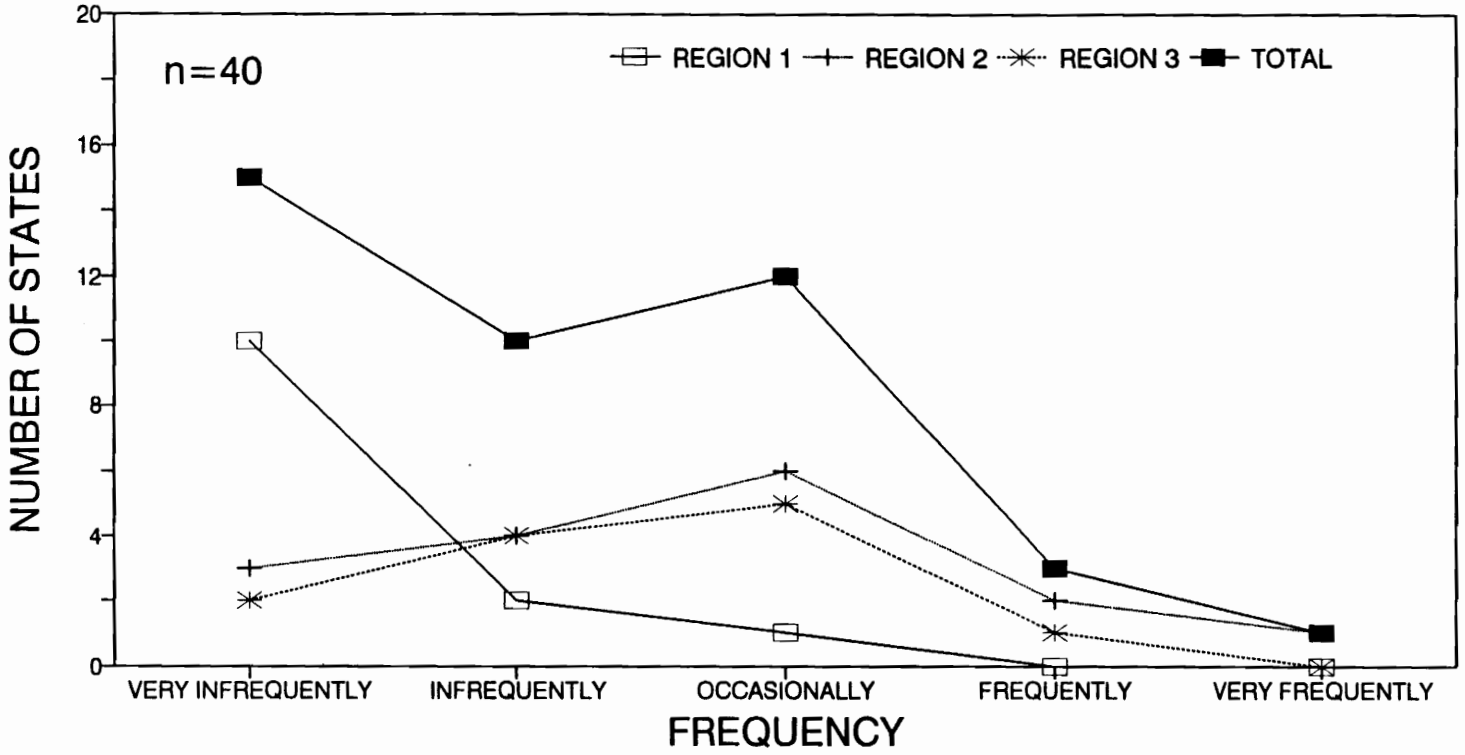

Figure 17. Frequency with which "daylighting" of roads appeared as a wildlife management recommendation in forest stewardship plans, as reported by FSP Coordinators.

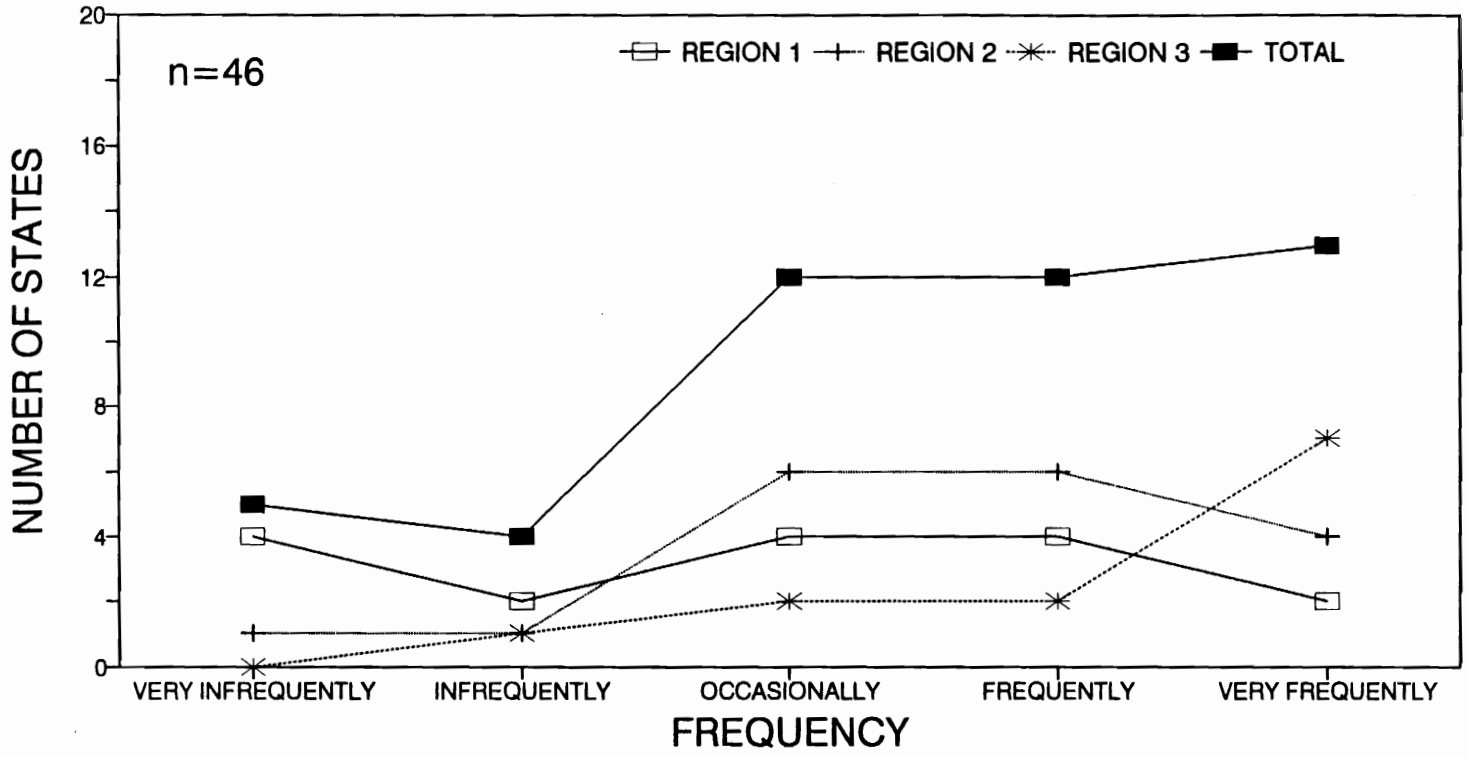

Figure 18. Frequency with which development of food plots appeared as a wildlife management recommendation in forest stewardship plans, as reported by FSP Coordinators.

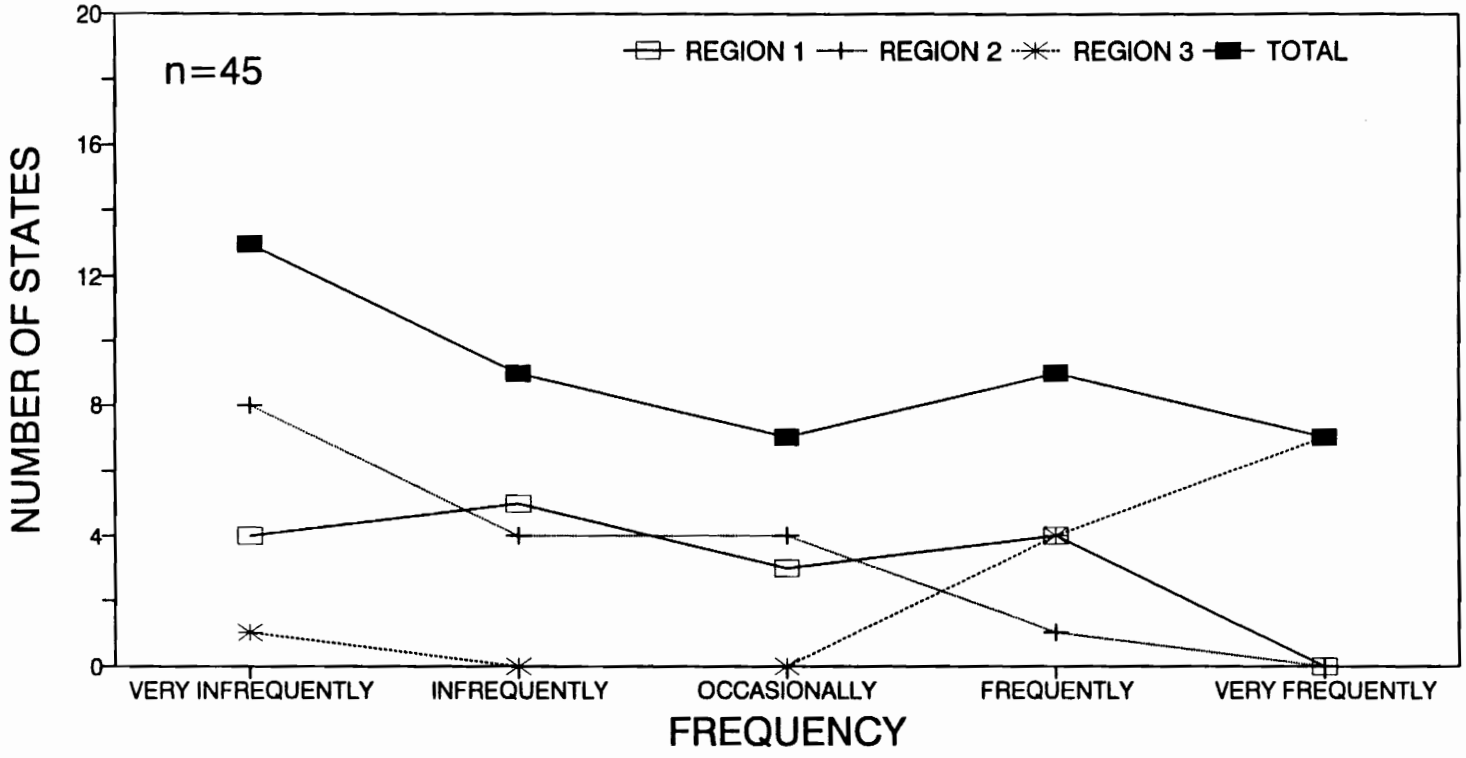

Figure 19. Frequency with which prescribed burning appeared as a wildlife management recommendation in forest stewardship plans, as reported by FSP Coordinators.

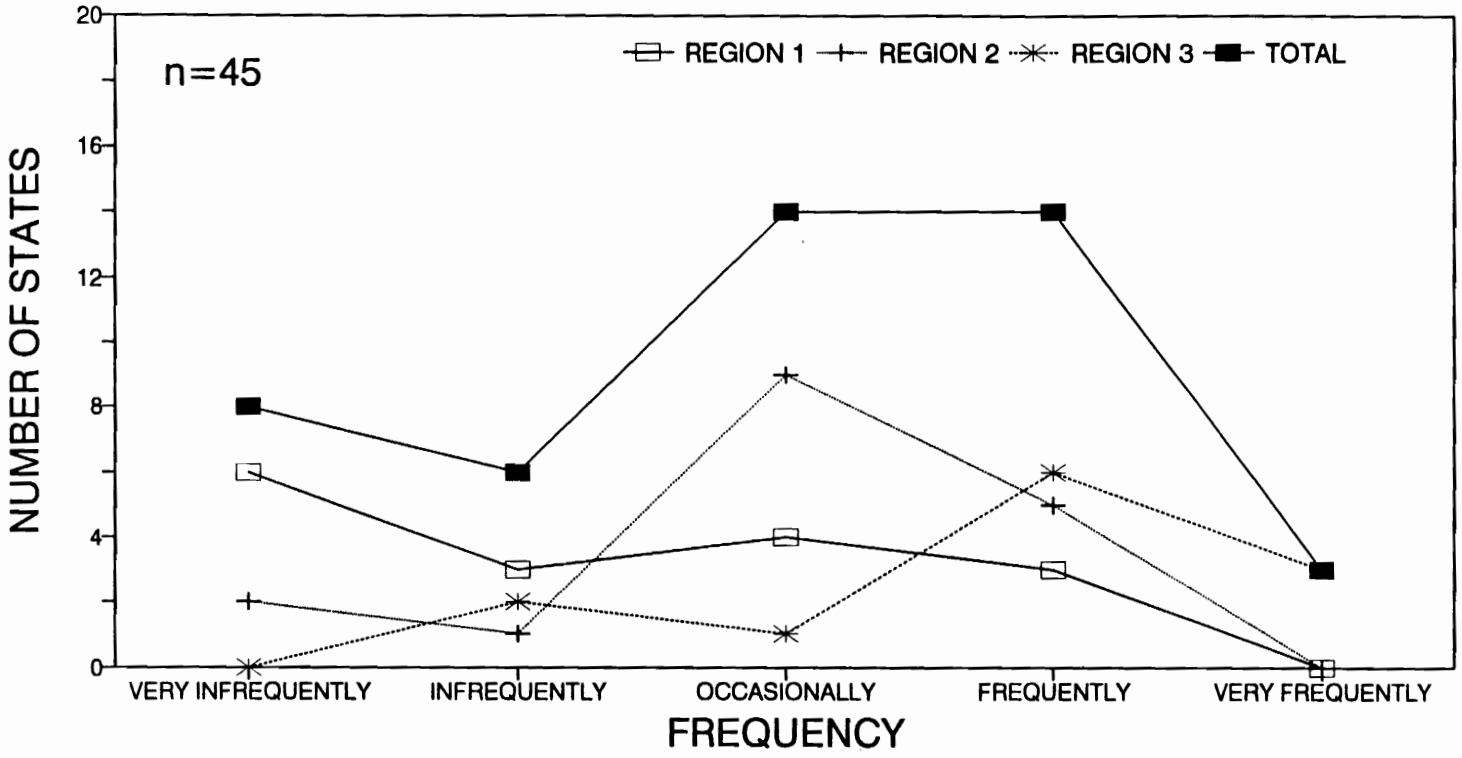

Figure 20. Frequency with which clearcutting as part of timber management appeared as a wildlife management recommendation in forest stewardship plans, as reported by FSP Coordinators.

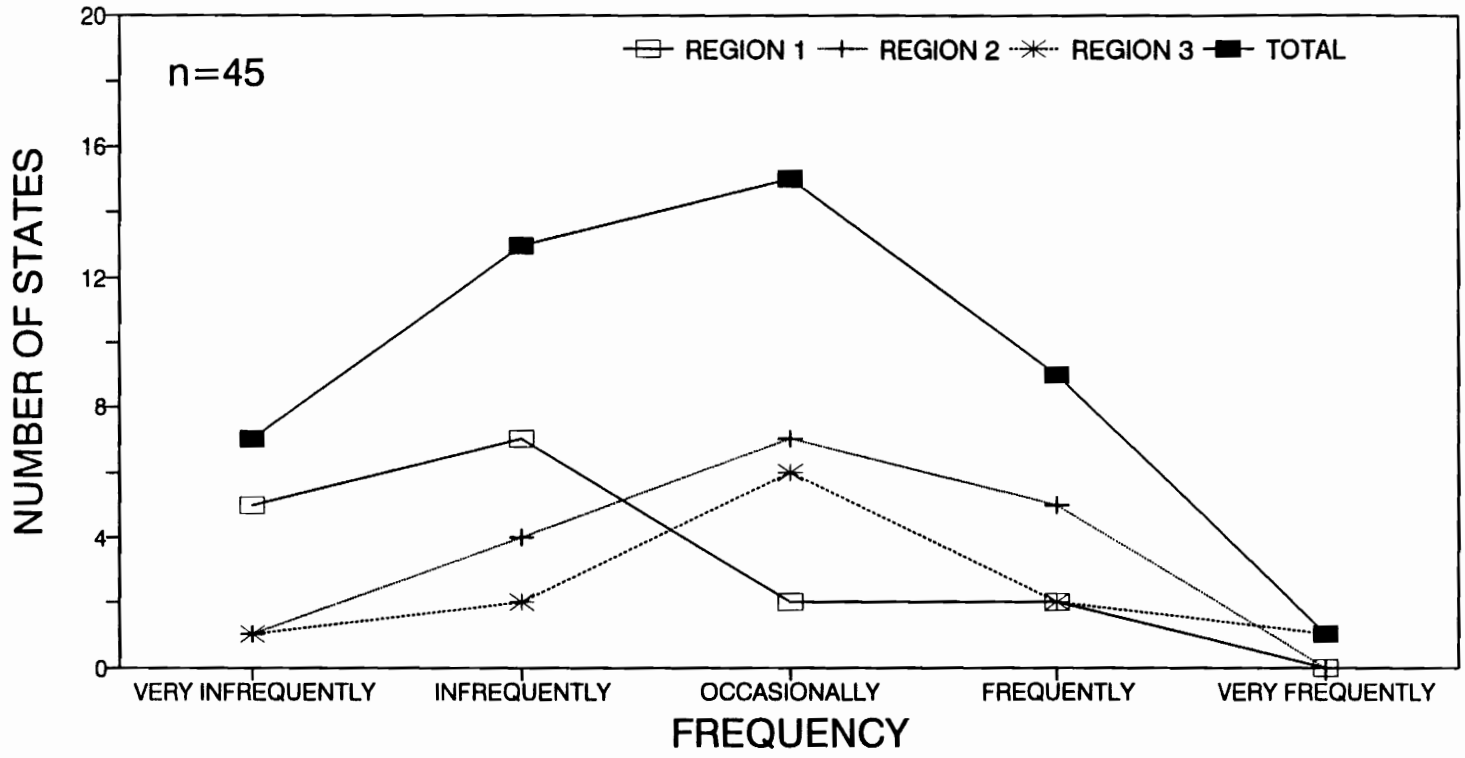

Figure 21. Frequency with which clearcutting for wildlife purposes only appeared as a wildlife management recommendation in forest stewardship plans, as reported by FSP Coordinators.

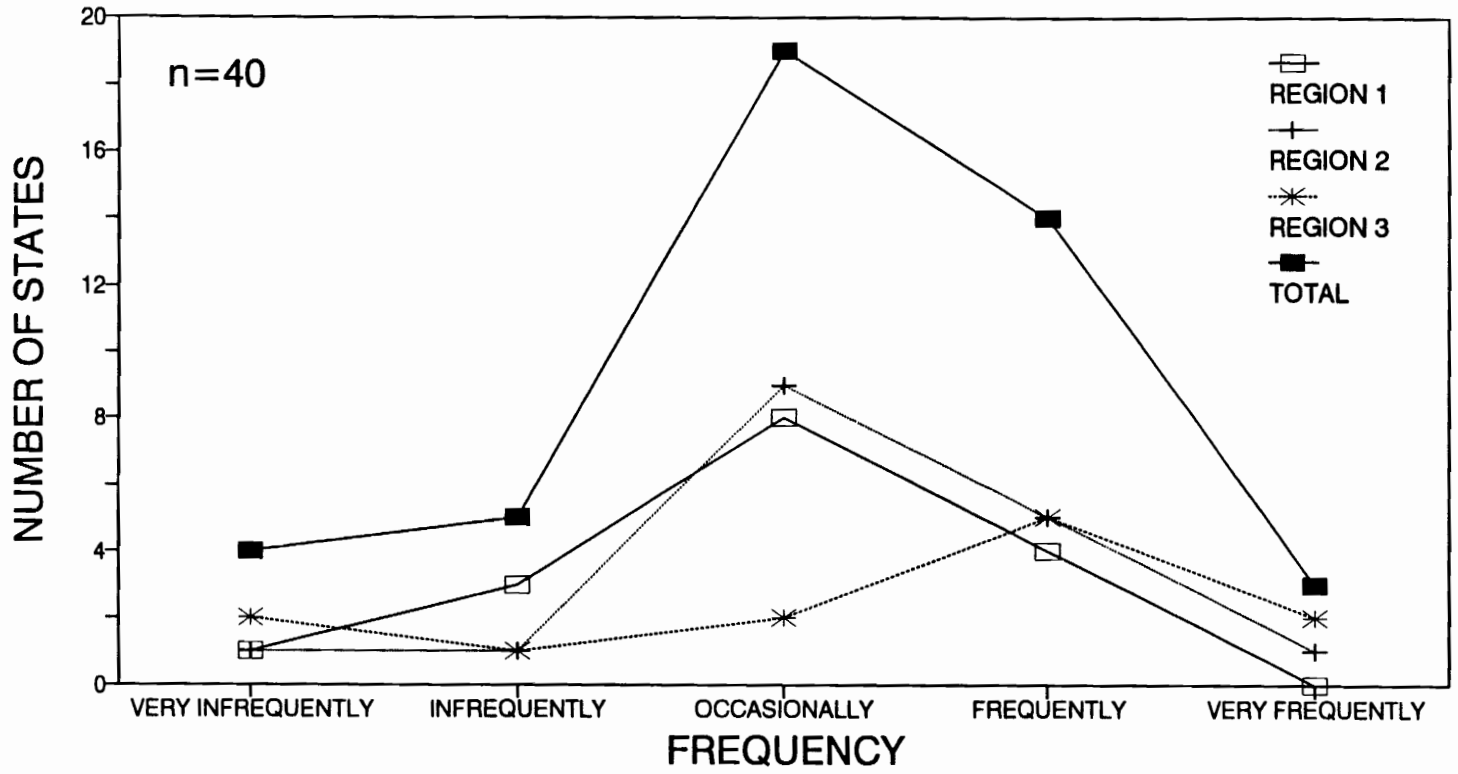

Figure 22. Frequency with which creation of forest openings associated with timber management appeared as a wildlife management recommendation in forest stewardship plans, as reported by FSP Coordinators.

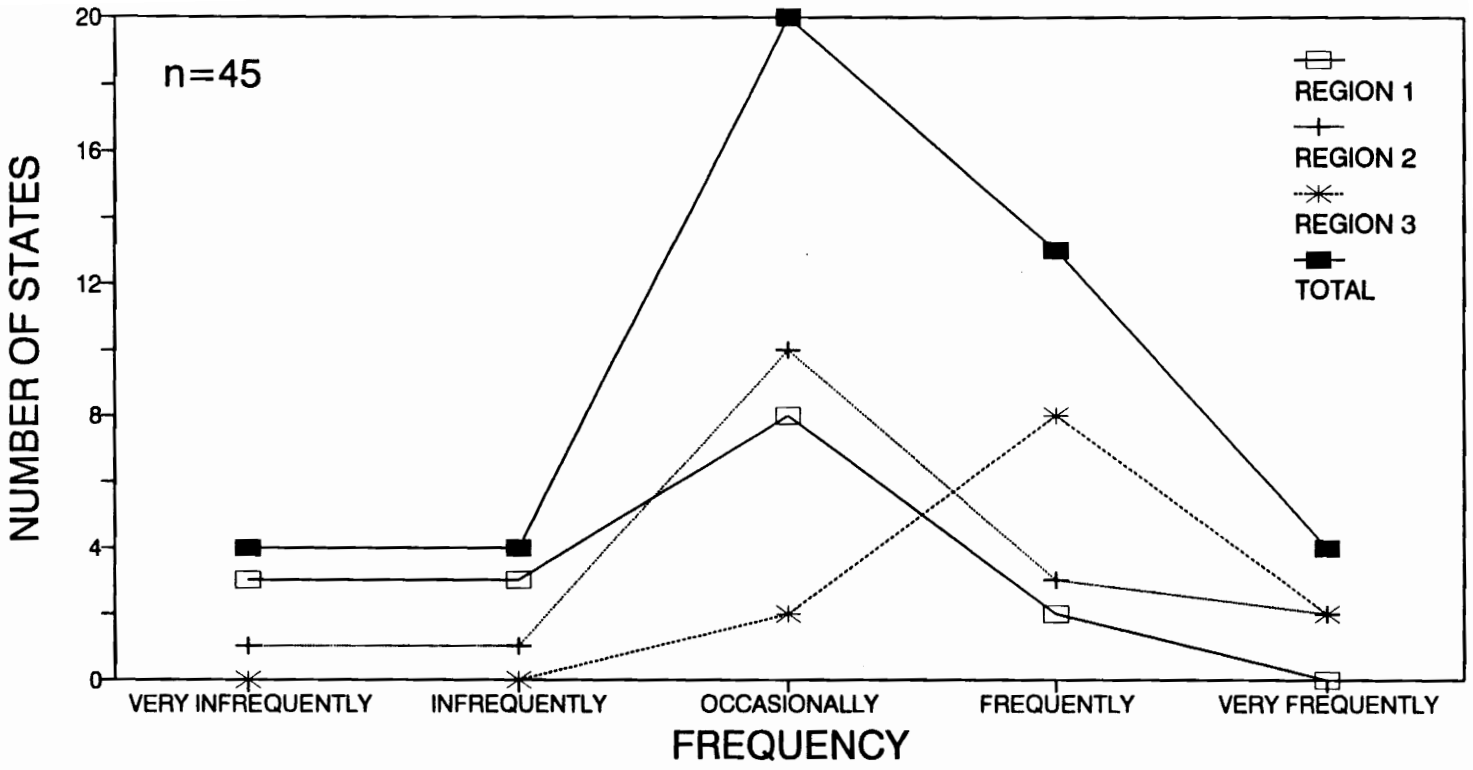

Figure 23. Frequency with which creation of forest openings for wildlife only appeared as a wildlife management recommendation in forest stewardship plans, as reported by FSP Coordinators.

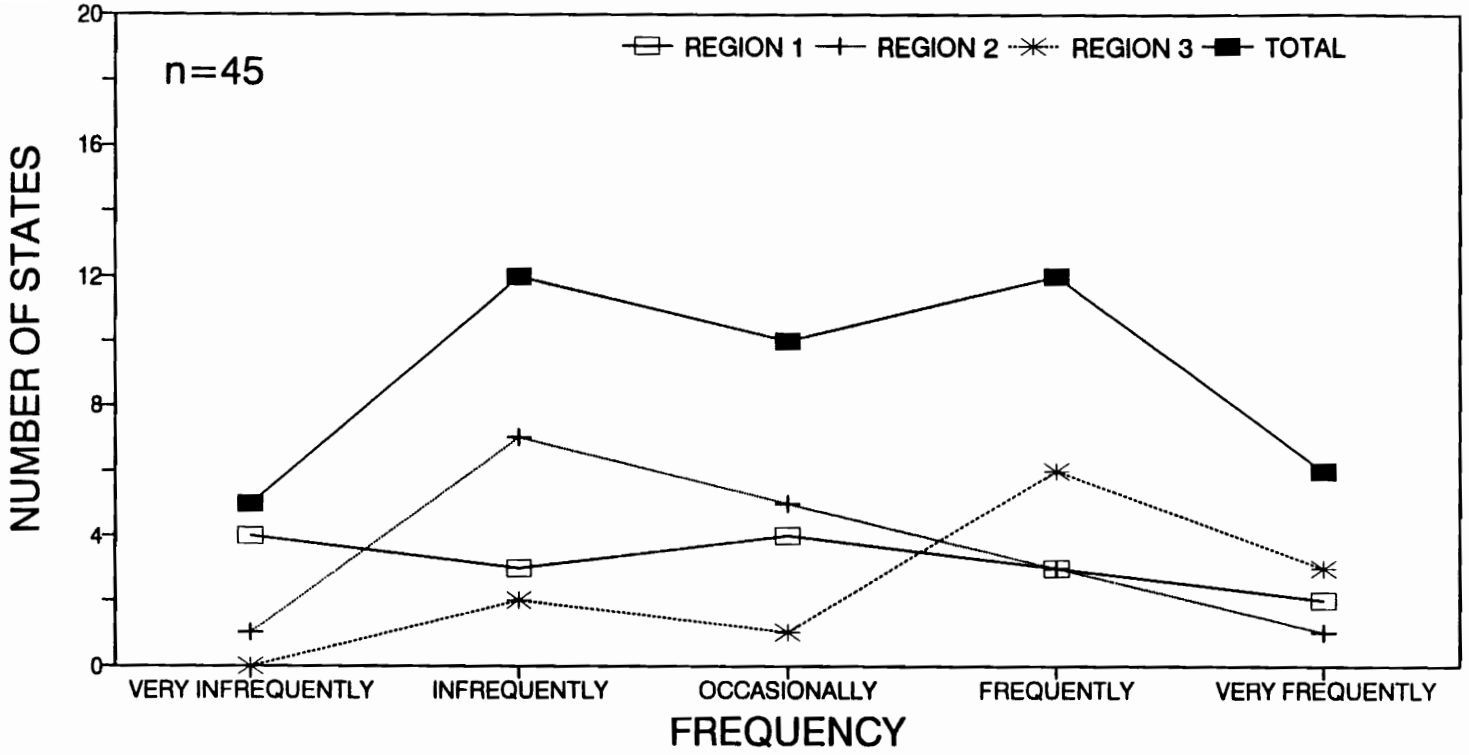

Figure 24. Frequency with which establishment of warm or cool season grass cover appeared as a wildlife management recommendation in forest stewardship plans, as reported by FSP Coordinators.

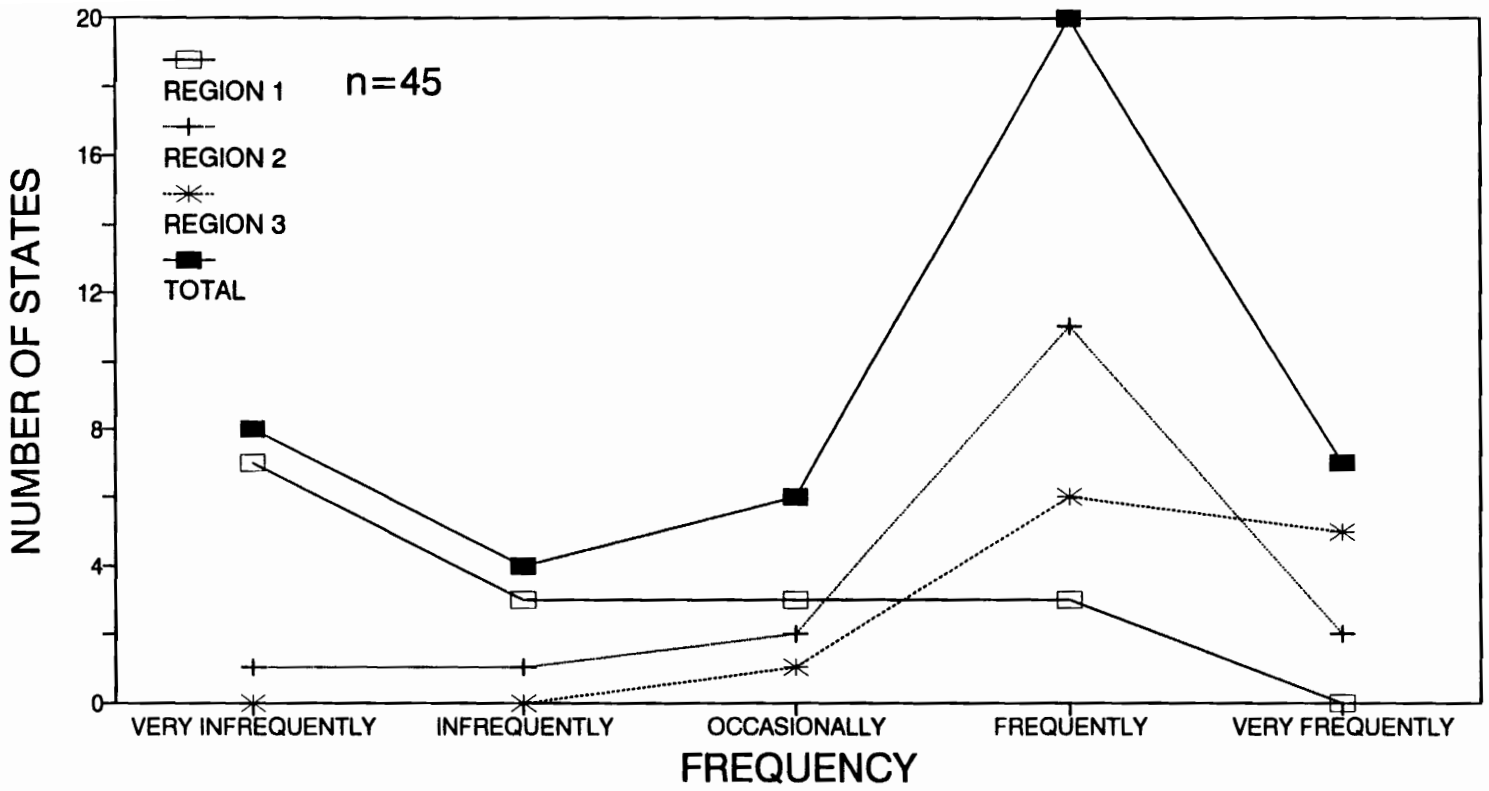

Figure 25. Frequency with which establishment of mast producing speices (hard or soft) appeared as a wildlife management recommendation in forest stewardship plans, as reported by FSP Coordinators.

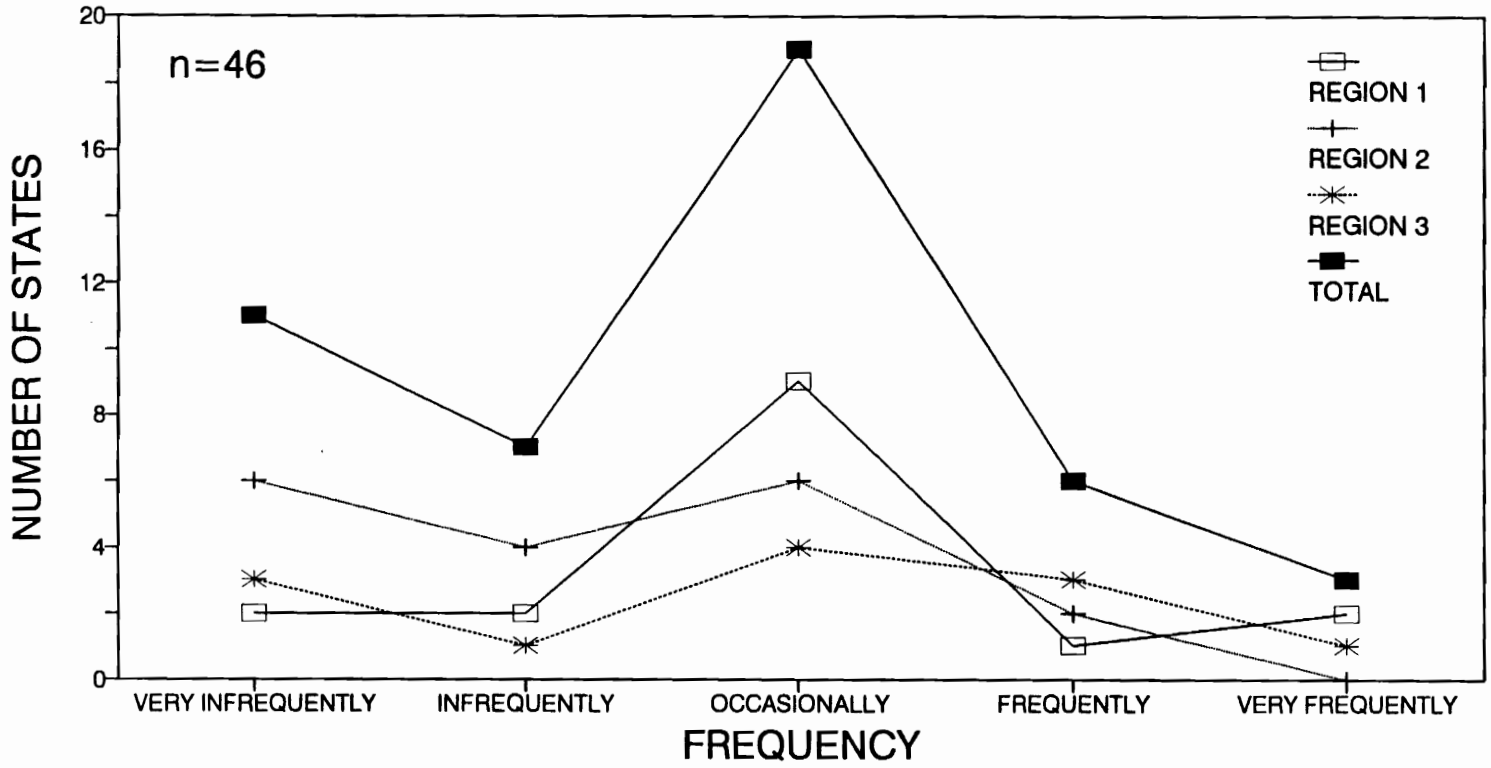

Figure 26. Frequency with which provision of a water source appeared as a wildlife management recommendation in forest stewardship plans, as reported by FSP Coordinators.

26). Overall, those appearing most often were snag creation and/or management, creation of edge, development of food plots, and establishment of mast producing species. "Daylighting" of roads appeared least often. The frequency of use of some techniques and practices differed significantly regionally. Construction of brush piles was recommended more frequently in the North than in the West and, significantly so, than in the South (K-W X^2= 9.908, df = 2, P = 0.007). Planting of hedgerows appeared significantly more often in plans in the West than those of both the North and South (K-W X^2= 14.521, df = 2, P = 0.001). "Daylighting" of roads was recommended significantly more often in the South and North than in the West (K-W X^2= 12.596, df = 2, P = 0.002). Development of food plots appeared as a recommendation in stewardship plans more often in the South than in the North and, significantly more so, than in the West (K-W X^2= 7.598, df = 2, P = 0.022). Prescribed burning was recommended significantly more often in the South than in either the North or West (K-W X^2= 19.227, df = 2, P = 0.000). Clearcut as part of a timber management plan and for wildlife purposes only both appeared more often in the South than in the North and, significantly so, the West (K-W X^2= 11.730, df = 2, P = 0.003; K-W X^2= 7.880, df = 2, P = 0.019, respectively). Creating forest openings for wildlife only and establishing warm or cool season grass cover were recommended significantly more often in the South than in both the North and West (K-W X^2 = 15.123, df = 2, P = 0.001; K-W X^2= 6.677, df = 2, P = 0.036, respectively). Establishing mast producing species was recommended more often in the South than in the North and, significantly so, than in the West (K-W X^2= 20.882, df = 2, P = 0.000). Regionally, no significant differences were detected in frequency of recommendation for construction of nest boxes or platforms (K-W X^2= 5.553, df = 2, P = 0.062), snag creation and/or management (K-W X^2 = 5.019, df = 2, P = 0.081), dead or downed wood management (K-W X^2= 4.531, df = 2, P = 0.104), creation of edge (K-W X^2= 2.939, df = 2, P = 0.230), creation of forest openings associated

with a timber management plan (K-W X^2= 1.926, df = 2, P = 0.382), and provision of a water source (K-W X^2= 3.400, df = 2, P = 0.183)

After the Plan

In 85% of the states (n = 46), some form of communication had occurred between the FSP agency and the landowner within 1 year of their receipt of a stewardship plan. This communication most often was a phone call (65% of states used it frequently or very frequently) (n = 36) (Figure 27). Site visits and letters/correspondences were used frequently or very frequently in approximately 50% of states (n = 38, n = 37 respectively) (Figures 28, 29). Questionnaires and newsletters were used very infrequently in 67% (n = 36) and 46% (n = 39) of states, respectively (Figures 30, 31). Regionally, no significant differences were detected in the frequency of using phone calls (K-W X^2= 0.817, df = 2, P = 0.665), site visits (K-W X^2= 1.686, df = 2, P = 0.431), questionnaires (K-W X^2= 0.030, df = 2, P = 0.985), and newsletters (K-W X^2= 2.057, df = 2, P = 0.358). However, letters/correspondence were used more often in the North than in the South and, significantly more so, than in the West (K-W X^2 = 6.529, df = 2, P = 0.038).

When asked the purpose of follow-up communication, FSP Coordinators identified the need for further assistance by landowners as the most common reason (74% of the states "frequently" or "very frequently", n = 39), followed by monitoring of landowner activities/compliance (e.g., BMP's) (54% "frequently" or "very frequently"), and checking for landowner's understanding of the plan or its recommendations (51% "frequently" or "very frequently", n = 39) (Figures 32-34). Follow-up regarding stewardship certification was important, but highly variable among states (41% "frequently" or "very frequently" vs. 35% "infrequently" or "very infrequently", n = 34) (Figure 35). Follow-up communication specifically about Stewardship Incentive Program (SIP) information occurred very frequently in only a

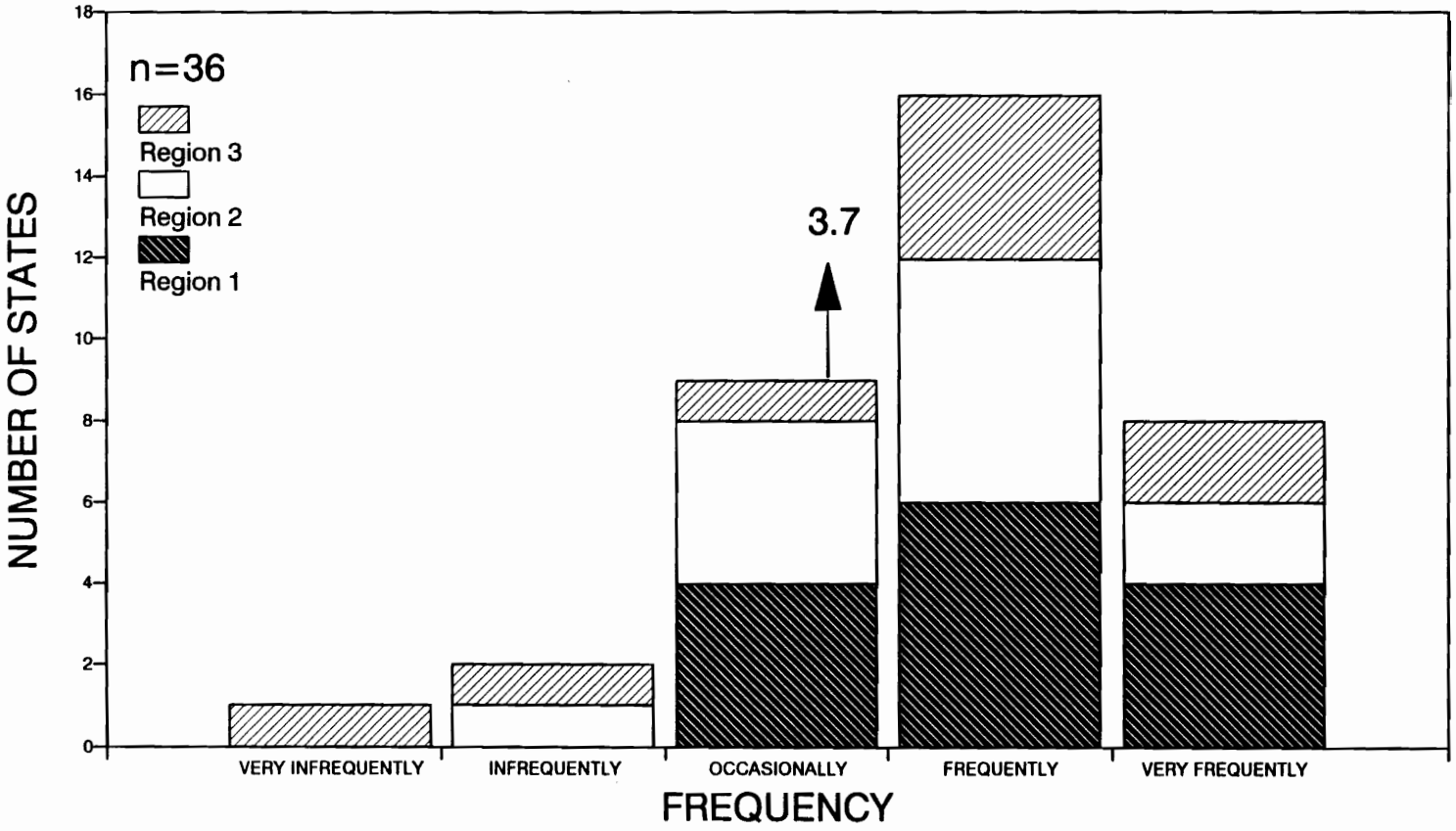

Figure 27. Frequency with which phone calls were used by FSP agencies as a means of communication with landowners following completion of stewardship plans, as reported by FSP Coordinators (arrow represents the national mean based on numeric conversion where very infrequently = 1, infrequently = 2, occasionally = 3, frequently = 4, and very frequently = 5).

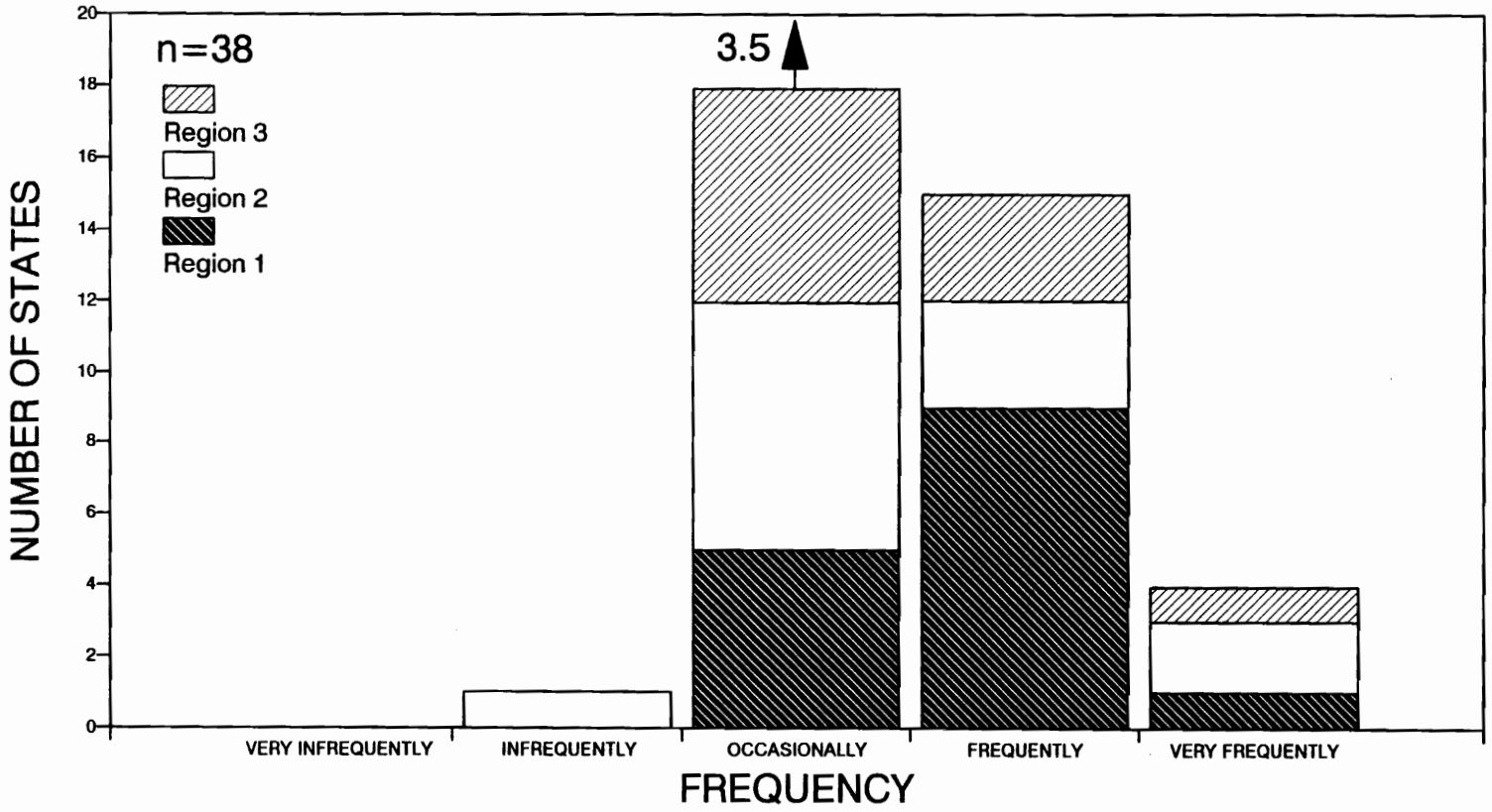

Figure 28. Frequency with which site visits were used by FSP agencies as a means of communication with landowners following completion of stewardship plans, as reported by FSP Coordiantors (arrow represents the national mean based on numeric conversion where very infrequently = 1, infrequently = 2, occasionally = 3, frequently = 4, and very frequently = 5).

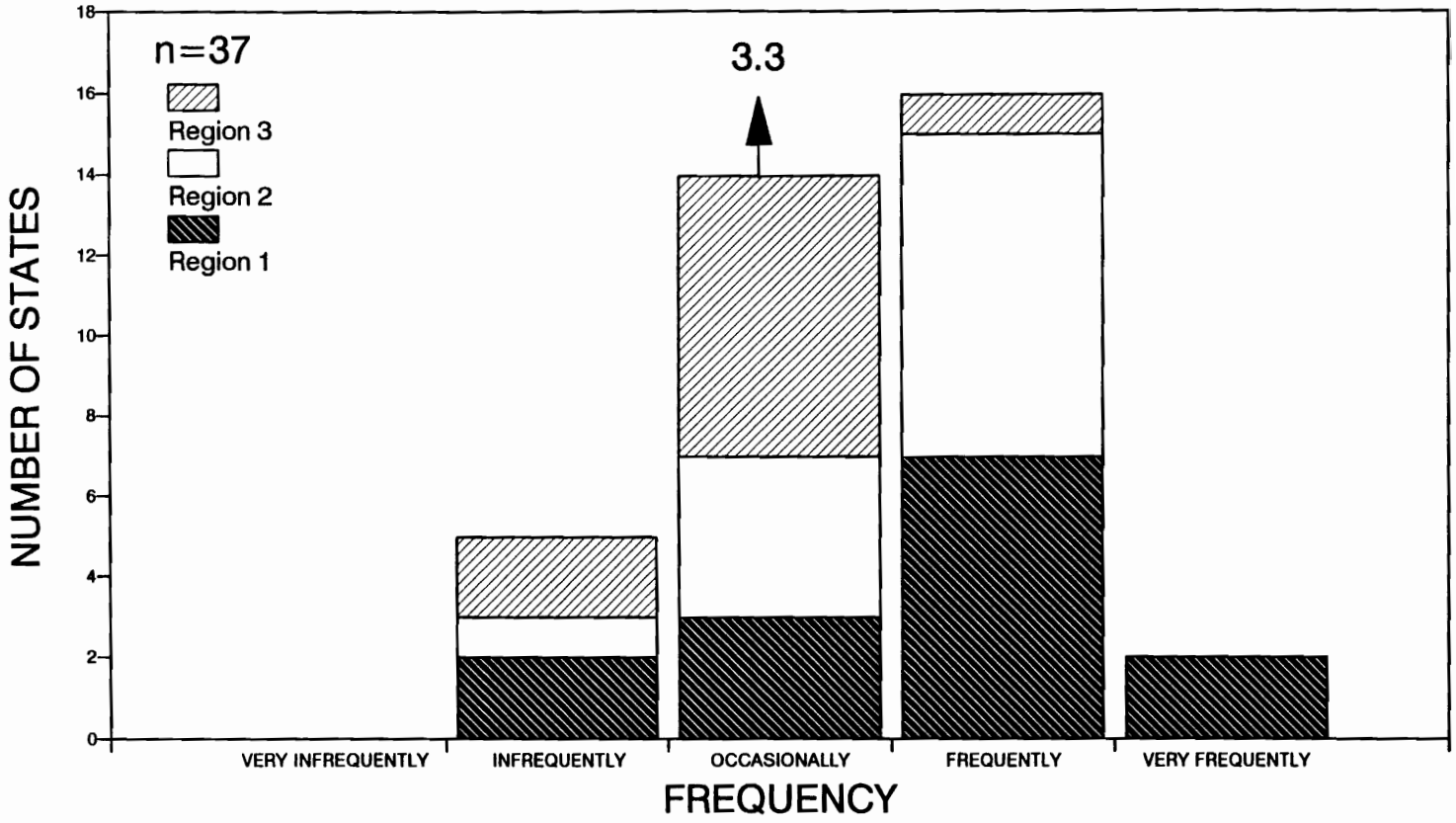

Figure 29. Frequency with which letters/correspondences were used by FSP agencies as a mean of communication with landowners following completion of stewardship plans, as reported by FSP Coordinatlrs (arrow represents the national mean based on numeric conversion where very infrequently = 1, infrequently = 2, occasionally = 3, frequently = 4, and very frequently = 5).

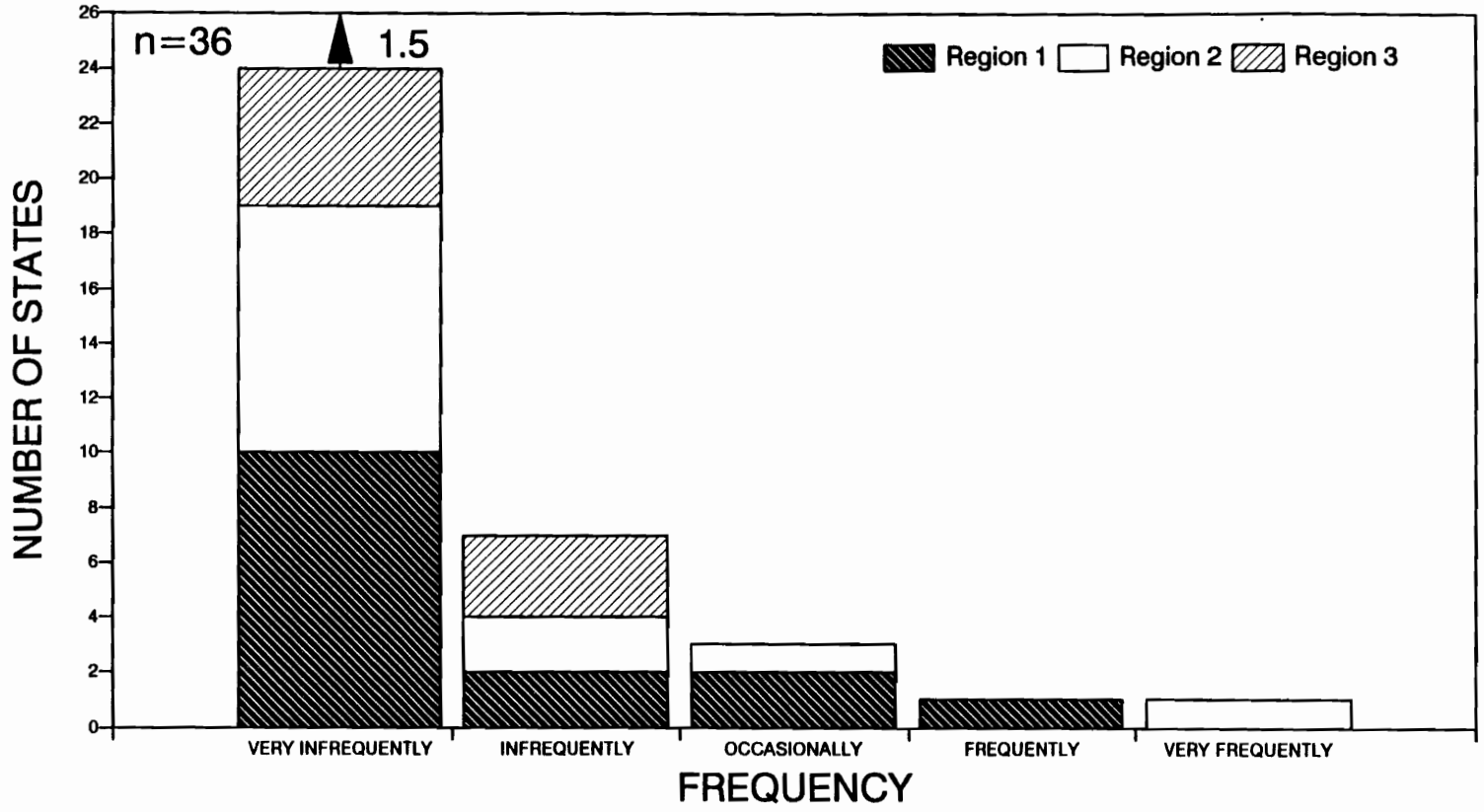

Figure 30. Frequency with which questionnaires were used by FSP agencies as a means of communication with landowners following completion of stewardship plans, as reported by FSP Coordinators (arrow represents the national mean based on numeric conversion where very infrequently = 1, infrequently = 2, occasionally = 3, frequently = 4, and very frequently = 5).

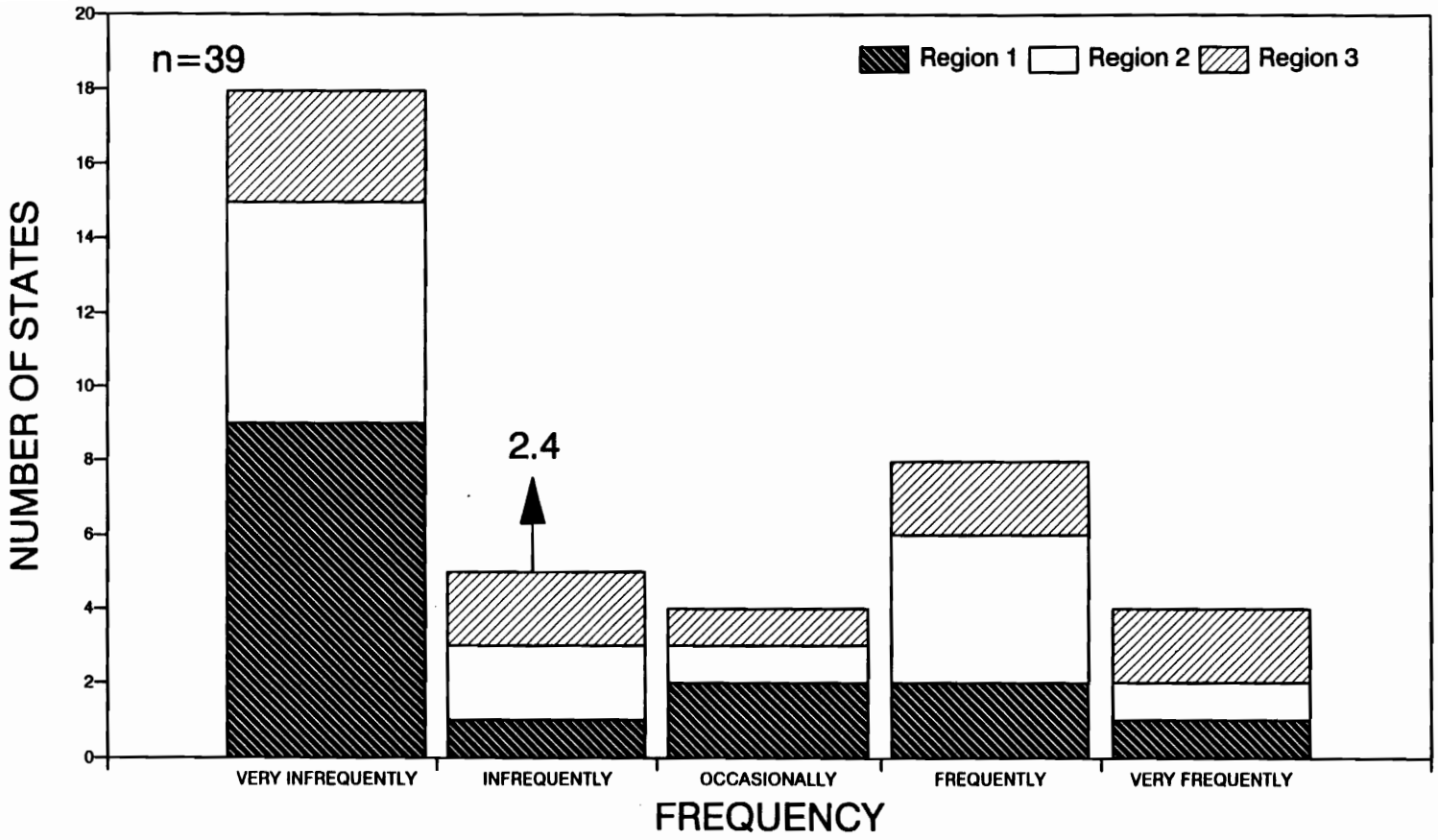

Figure 31. Frequency with which newsletters were used by FSP agencies as a means of communication with landowners following completion of stewardship plans, as reported by FSP Coordinators (arrow represents the national mean based on numeric conversion where very infrequently = 1, infrequently = 2, occasionally = 3, frequently = 4, and very frequently = 5).

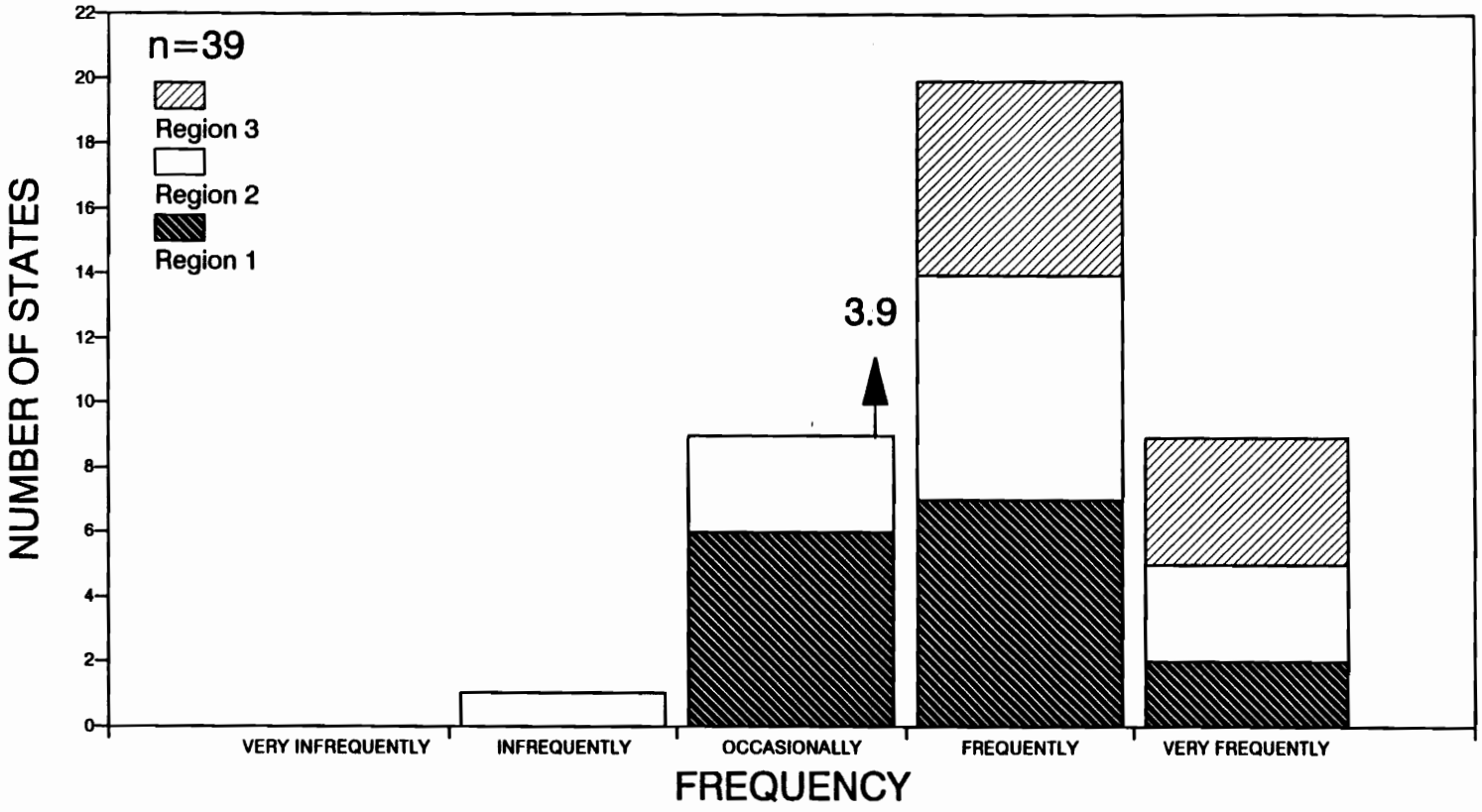

Figure 32. Frequency of follow-up communication between landowners and FSP agencies for the purpose of providing further technical assistance, as reported by FSP Coordinators (arrow represents the national mean based on numeric conversion where very infrequently = 1, infrequently = 2, occasionally = 3, frequently = 4, very frequently = 5).

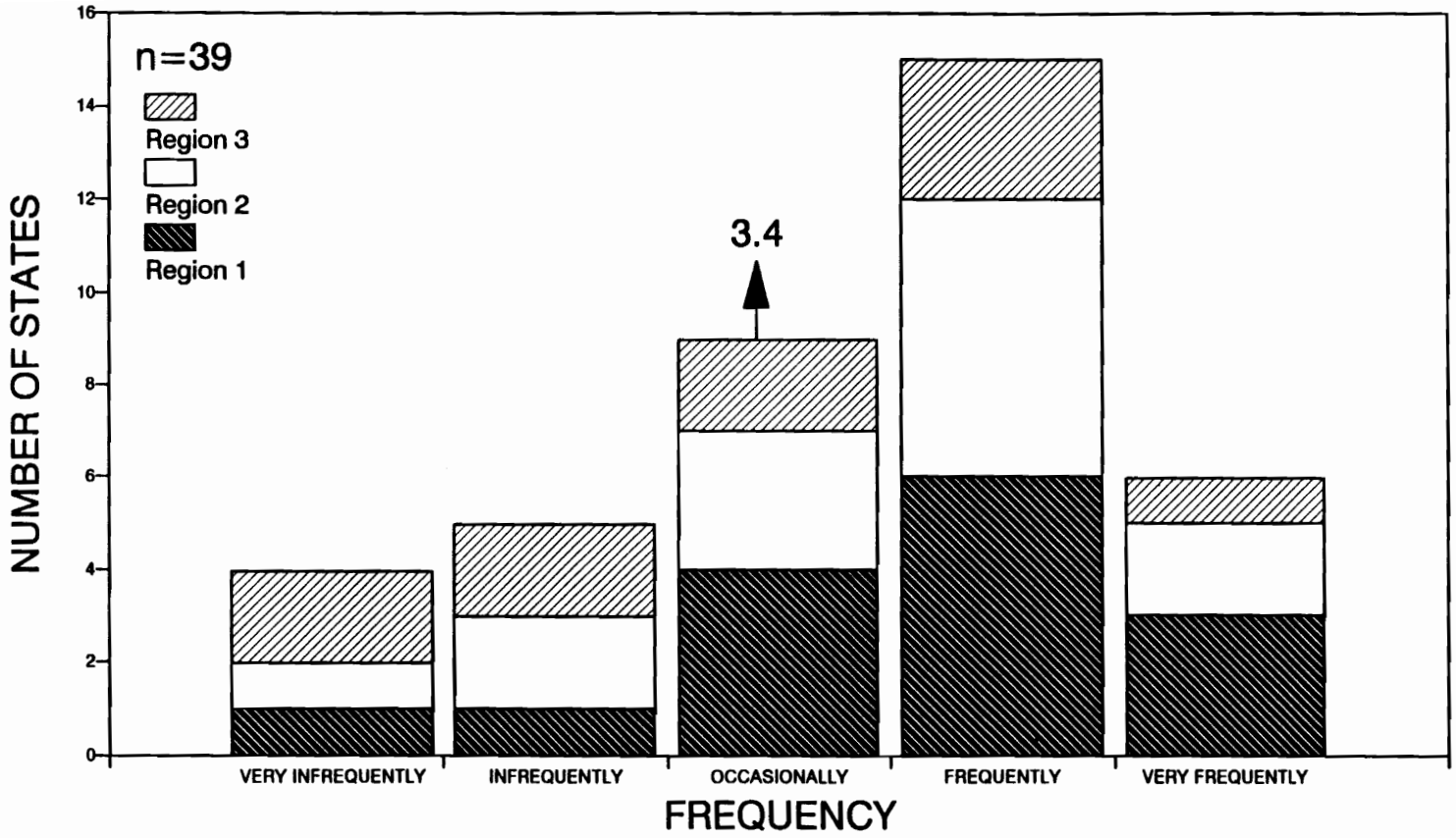

Figure 33. Frequency of follow-up communication between landowners and FSP agencies for the purpose of monitoring activities/compliance (e.g., BMP's), as reported by FSP Coordinators (arrow represents the national mean based on numeric conversion where very infrequently = 1, infrequently = 2, occasionally = 3, frequently = 4, and very frequently = 5).

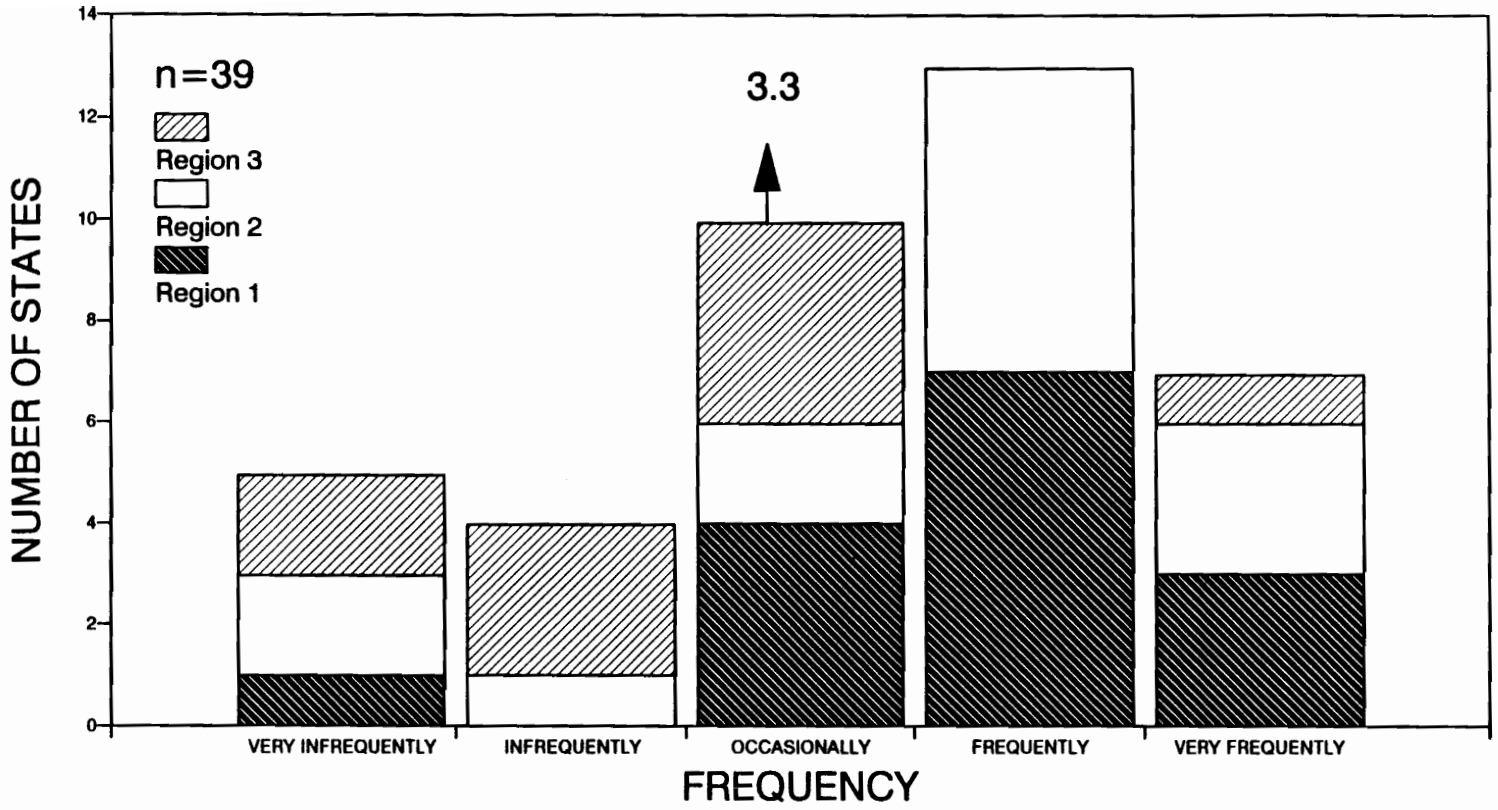

Figure 34. Frequency of follow-up communication between landowners and FSP agencies for the purpose of checking landowners' understanding of the stewardship plan received or its recommendations, as reported by FSP Coordinators (arrow represents the national mean based on numeric conversion where very infrequently = 1, infrequently = 2, occasionally = 3, frequently = 4, and very frequently = 5).

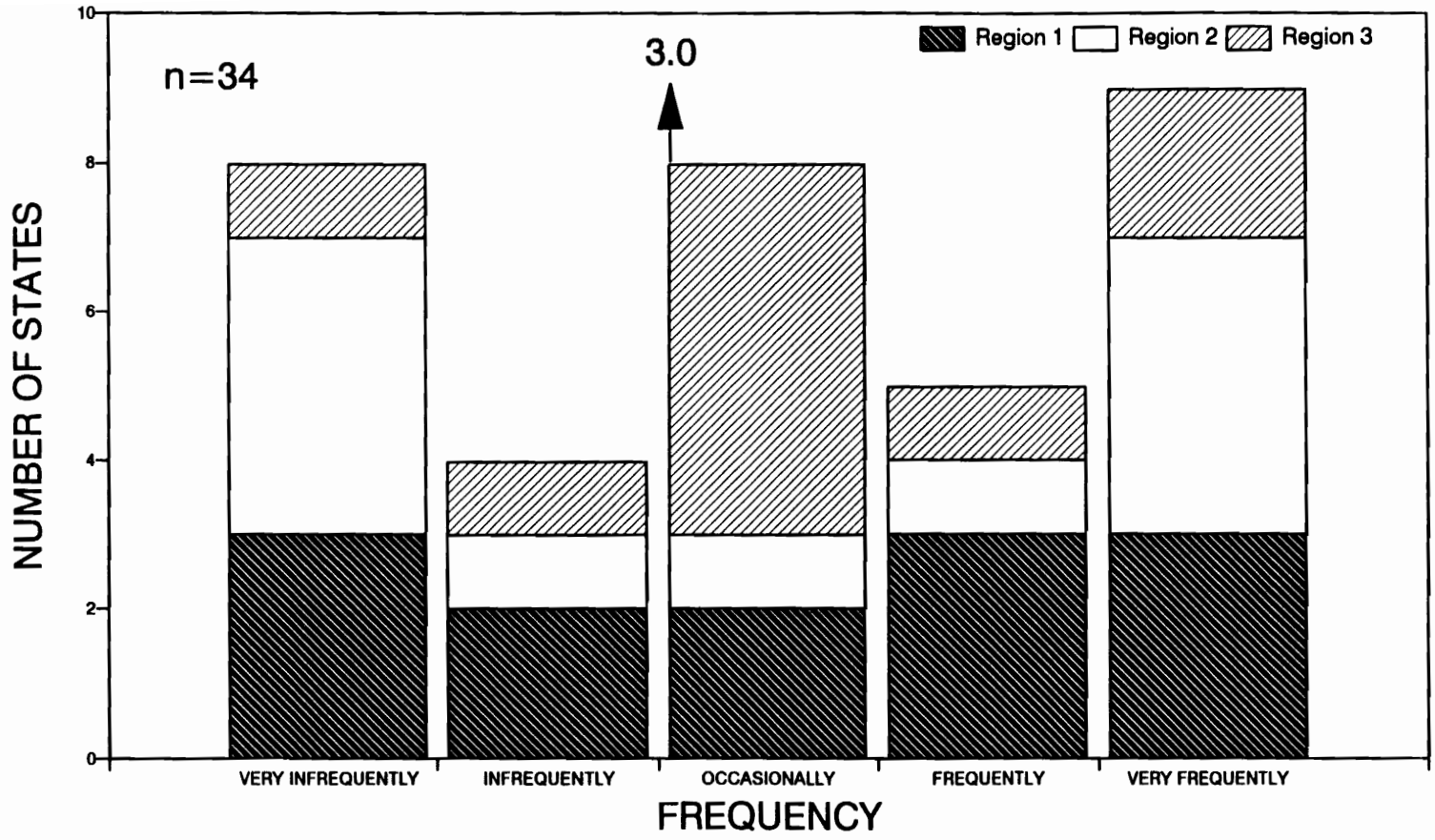

Figure 35. Frequency of follow-up communication between landowners and FSP agencies for the purpose of stewardship certification of landowners, as reported by FSP Coordinators (arrow represents the national mean based on numeric conversion where very infrequently = 1, infrequently = 2, occasionally = 3, frequently = 4, and very frequently = 5).

few states (56%, n = 7). Other reasons noted by FSP Coordinators for conducting follow-up with landowners included a need to provide additional information, keep landowner interest up, and extend invitations to other programs. Regionally, no significant differences were detected in the use of follow-up communication for monitoring activities/compliance (K-W X^2= 1.800, df = 2, P = 0.407), certification (K-W X^2 = 0.052, df = 2, P = 0.974), further assistance (K-W X^2 = 5.287, df = 2, P = 0.071), SIP information (K-W X^2= 2.636, df = 2, P = 0.268), or "others" (K-W X^2= 1.668, df = 2, P = 0.435). However, follow-up on landowner's understanding of the plan or its recommendation was more frequent in the West than in the North and, significantly more so, than in the South (K-W X^2= 6.761, df = 2, P = 0.034).

Follow-up communication was initiated mainly by the FSP agency (45%) and landowners (46%); consultants and "others" (including extension, forest industry, owner agents, referrals by other agencies, Soil Conservation Districts [SCD], NRCS, and Soil and Water Conservation Districts [SWCD] staff) initiated few follow-up contacts (5%, 4% respectively) (Table 7). Regionally, no significant differences were detected in the percent of communication initiated by FSP agency (K-W X^2= 3.167, df = 2, P = 0.205), landowners (K-W X^2 = 4.427, df = 2, P = 0.109), or "others" (K-W X^2 = 3.135, df = 2, P = 0.209). However, consultants initiated follow-up communication more frequently in the North than in the South and, significantly more so, than in the West (K-W X^2 = 7.451, df = 2, P = 0.024) .

When asked about the frequency with which landowners actually conducted wildlife management activities recommended in their stewardship plans, 58% of FSP Coordinators reported a belief that landowners frequently conducted activities specifically promoting consumptive wildlife uses (n = 45) (Figure 36). Activities specifically promoting non-consumptive wildlife uses were perceived to be carried out "frequently" in 51% of the states (n = 45) (Figure 37). General wildlife improvement activities were perceived to be implemented "frequently" in 67% of states (n = 45)

Table 7. Percentage of follow-up communication initiated by stewardship agency, landowners, consultants, and others[a], as reported by FSP Coordinators.

Location	Source of Communication							
	Agency		Landowner		Consultants		Others	
Subregion 1	51		44		5		0	
Subregion 2	43		44		0		13	
Subregion 3	50		45		0		5	
REGION 1	47	A[b]	44	A	1	B	7	A
Subregion 4	57		40		0		3	
Subregion 5	41		40		18		1	
REGION 2	48	A	40	A	10	A	2	A
Subregion 6	42		55		3		0	
Subregion 7	25		67		5		3	
REGION 3	37	A	59	A	4	A	1	A
OVERALL	45		46		5		4	

[a] Includes cooperative extension, forest industry, owner agents, SCD, NRCS (formerly SCS), SWCD, and other agencies.

[b] For each region, means within a column denoted by the same capital letter are not different ($P<0.05$).

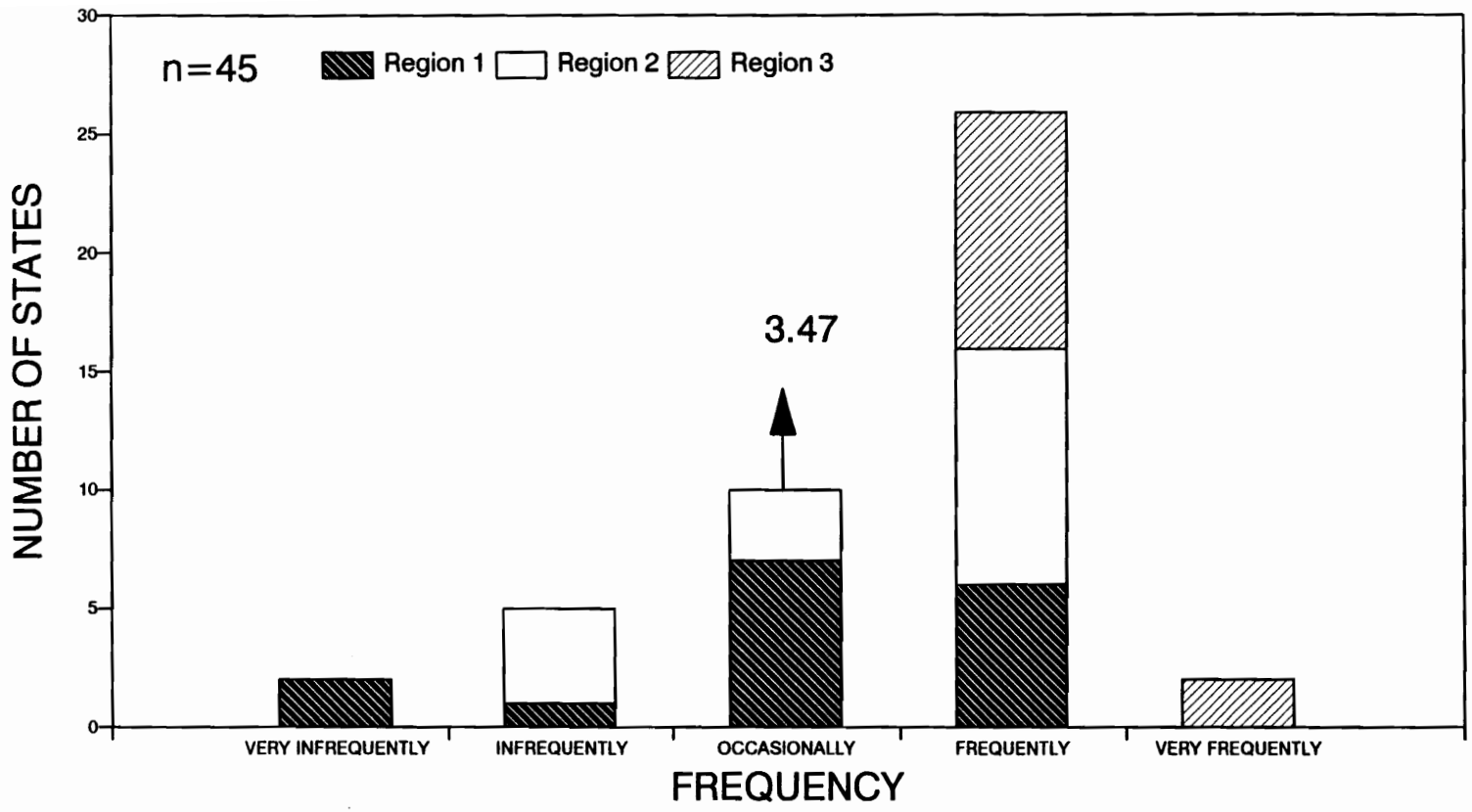

Figure 36. Frequency with which landowners actually conducted activities specifically promoting consumptive wildlife uses, as reported by FSP Coordinators (arrow represents the national mean based on numeric conversion where very infrequently = 1, infrequently = 2, occasionally = 3, frequently = 4, and very frequently = 5).

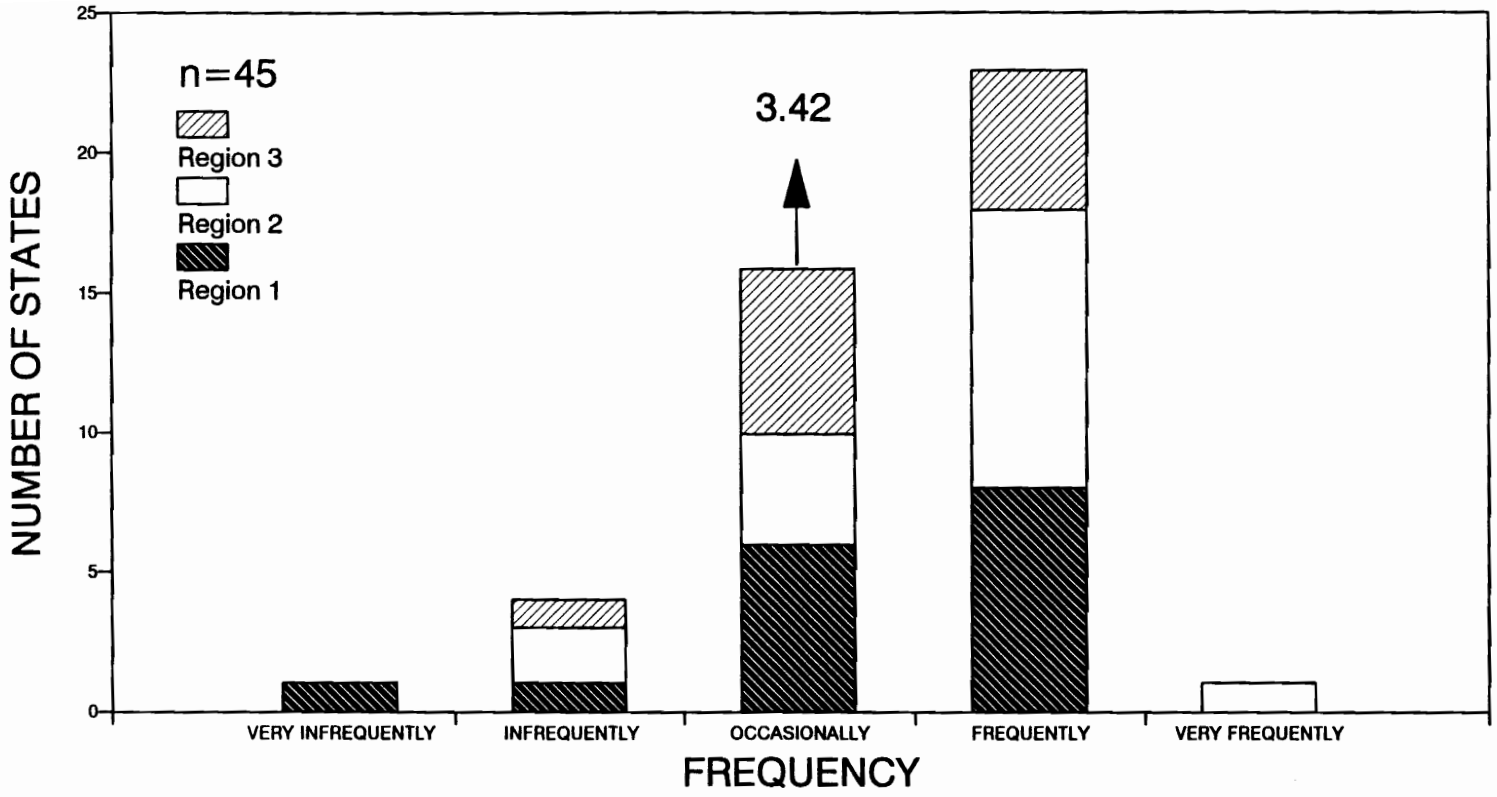

Figure 37. Frequency with which landowners actually conducted activities specifically promoting non-consumptive wildlife uses, as reported by FSP Coordinators (arrow represents the national mean based on numeric conversion where very infrequently = 1, infrequently = 2, occasionally = 3, frequently = 4, and very frequently = 5).

(Figure 38). Activities promoting consumptive wildlife uses were perceived to be carried out significantly more frequently in the South and North than in the West (K-W X^2 = 12.460, df = 2, P = 0.002). However, there were no significant differences detected in perceived implementation frequency of non-consumptive (K-W X^2= 1.405, df = 2, P = 0.495) or general (K-W X^2= 1.308, df = 2, P = 0.520) wildlife recommendations.

Implementing all wildlife recommendations that appeared in the stewardship plan was not mandatory for a landowner to receive stewardship certification in 91% of the states responding (n = 44). Only Arizona, Delaware, Mississippi, and Tennessee required that all wildlife recommendations be implemented before stewardship certification could be obtained.

The Forest Stewardship Program in Virginia

Characteristics of Virginia Stewardship Landowners

Most respondents (87.1%, n = 217) were male, 50-59 years old (29.8%, n = 218), held a Bachelor's degree (35.8%, n = 215), and currently were married (85.3%, n = 218) (Figures 39, 40). Spouses most frequently were 40 - 49 years old (37.8%, n = 185) and also held a Bachelor's degree (31.3%, n = 182) (Figures 41, 42). The percentage of female respondents in the Mountain region (22.1%, n = 77) was greater than that in either the Piedmont (9.4%, n = 106) or the Coastal region (3.1%, n = 32). Sex of respondent appeared to differ among physiographic regions (K-W X^2 = 0.204, df = 2, P = 0.010), however, multiple comparison tests could not identify such differences. This may have been due to the highly skewed sex ratio among respondents. No significant differences were detected among years or administrative region for sex of respondent (K-W X^2 = 1.453, df = 2, P = 0.484; K-W X^2 = 7.306, df = 5, P = 0.199, respectively). There were no significant differences among years,

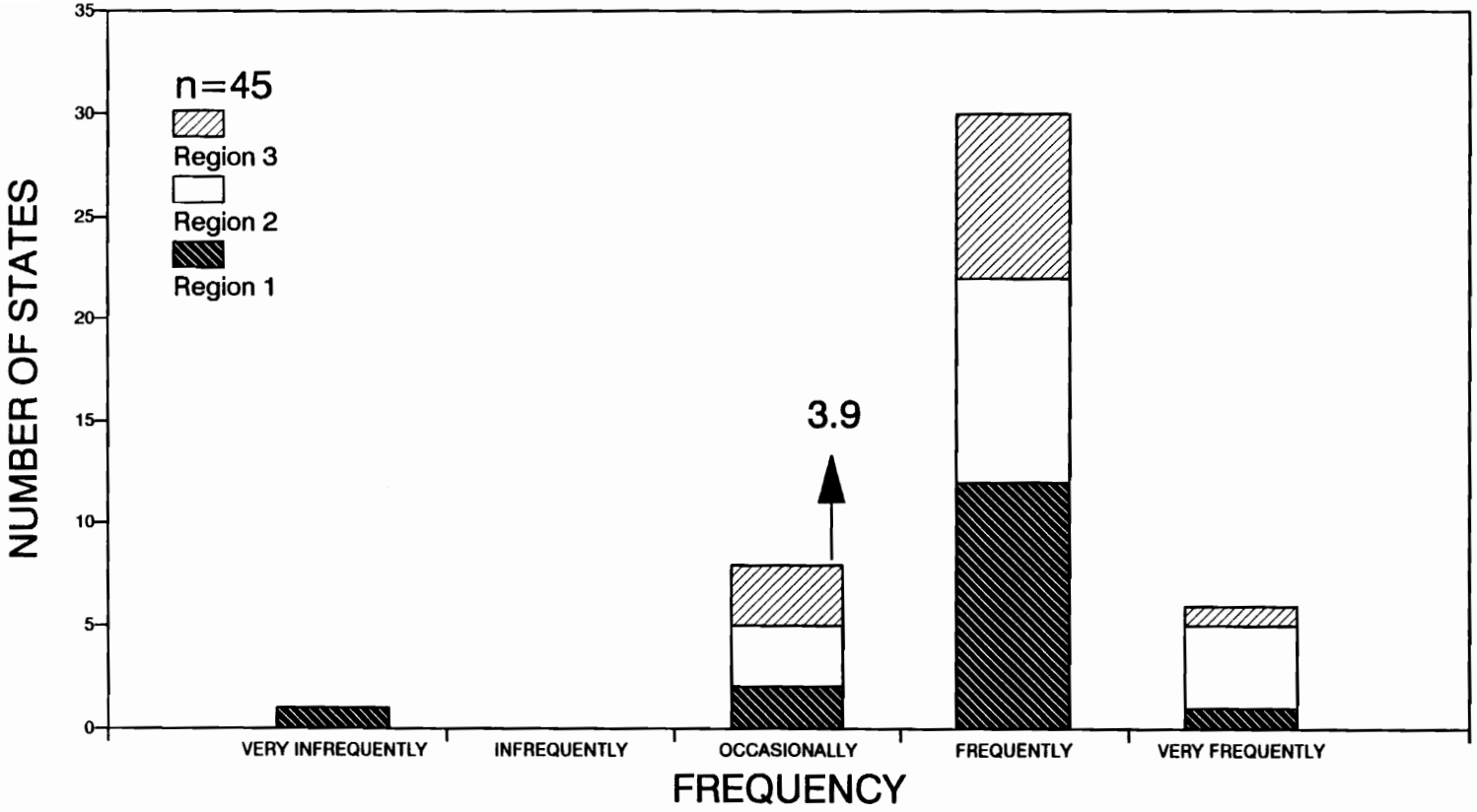

Figure 38. Frequency with which landowners actually conducted activities promoting general wildlife improvements, as reported by FSP Coordinators (arrow represents the national mean based on numeric conversion where very infrequently = 1, infrequently = 2, occasionally = 3, frequently = 4, and very frequently = 5).

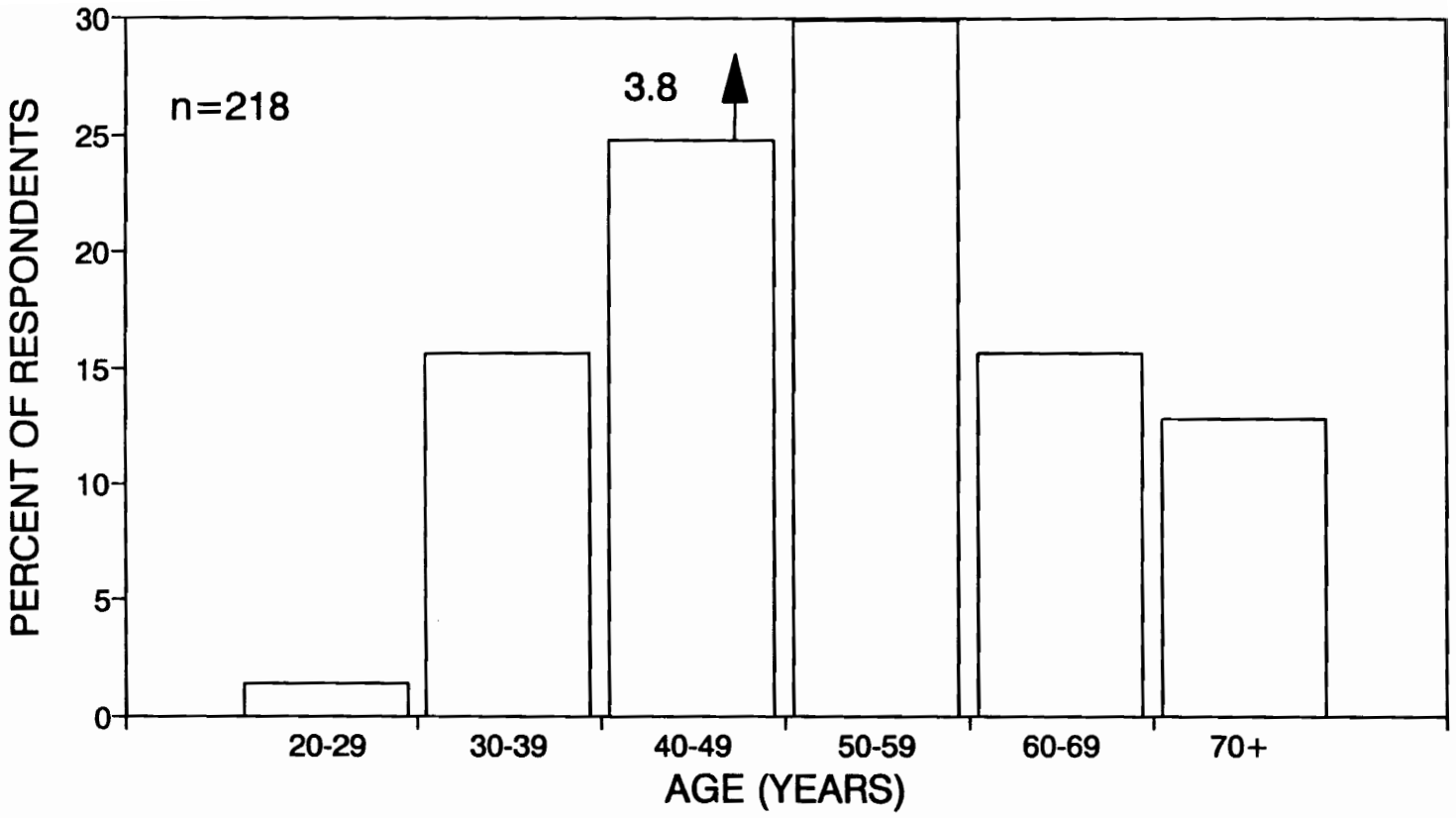

Figure 39. Age of respondents from the pool of VA FSP participants from 1991 through 1993 (arrow represents mean age of respondent based on numeric conversion where 20-29 years = 1, 30-39 years = 2, 40-49 years = 3, 50-59 years = 4, 60-69 years = 5, and 70+ years = 6).

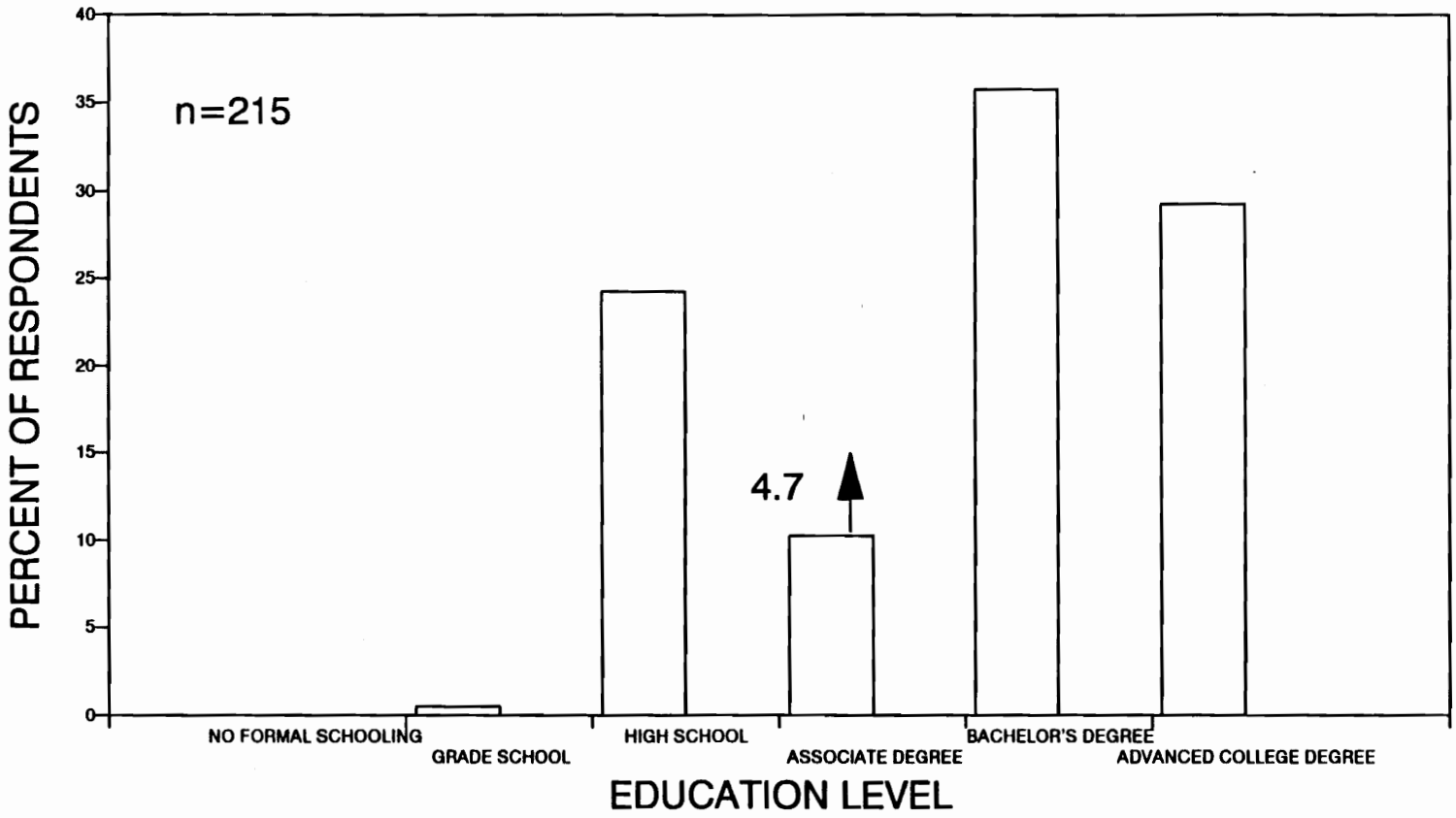

Figure 40. Highest level of education completed or currently enrolled in among VA FSP participants from 1991 through 1993 (arrow represents the mean respondent education level based on numeric conversion where no formal schooling = 1, grade school = 2, high school = 3, associate degree = 4, Bachelor's degree = 5, and advanced college degree = 6).

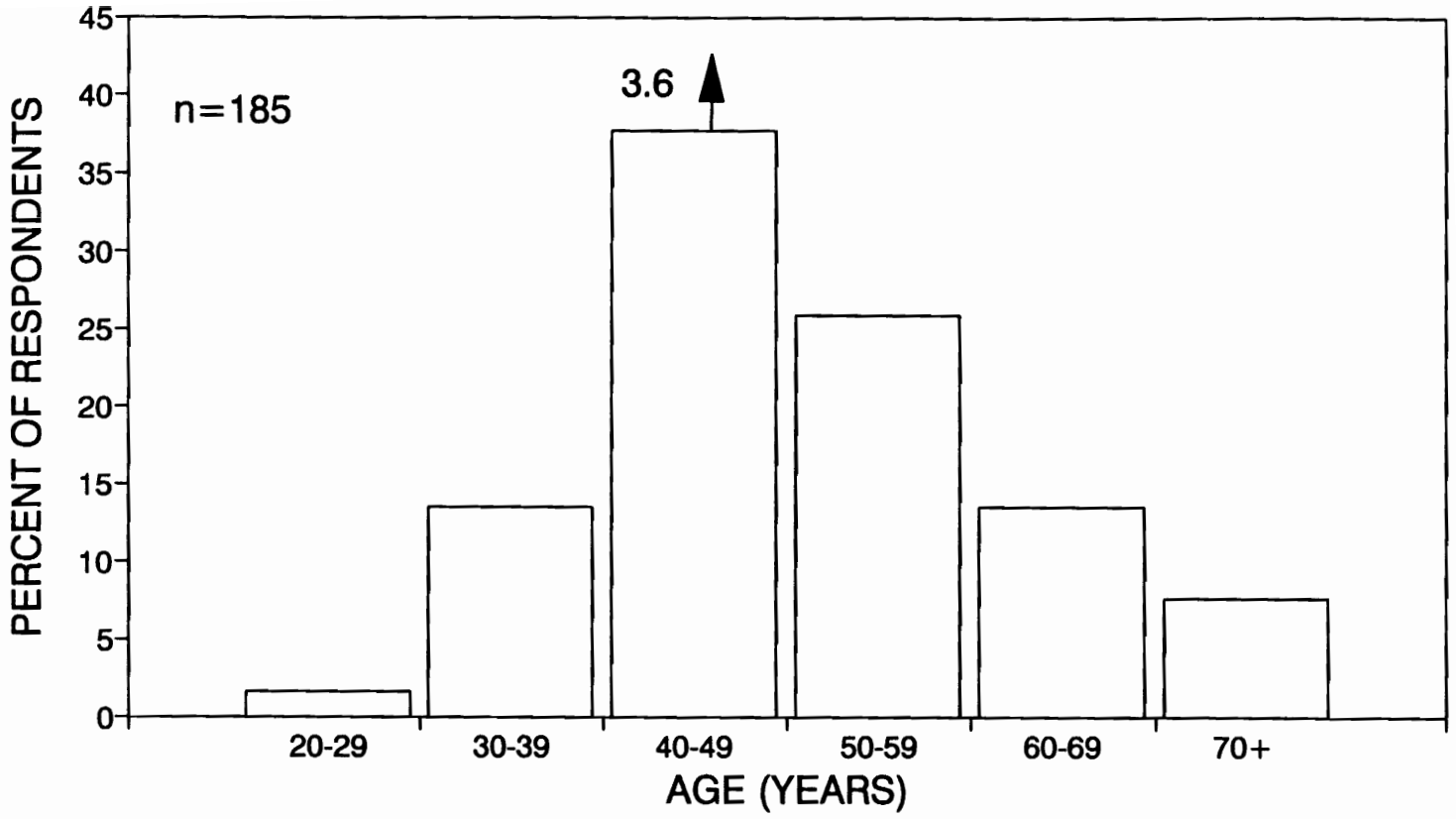

Figure 41. Age of spouse of respondent from among VA FSP participants from 1991 through 1993 (arrow represents mean age based on numeric conversion where 20-29 years = 1, 30-39 years = 2, 40-49 years = 3, 50-59 years = 4, 60-69 years = 5, and 70+ years = 6).

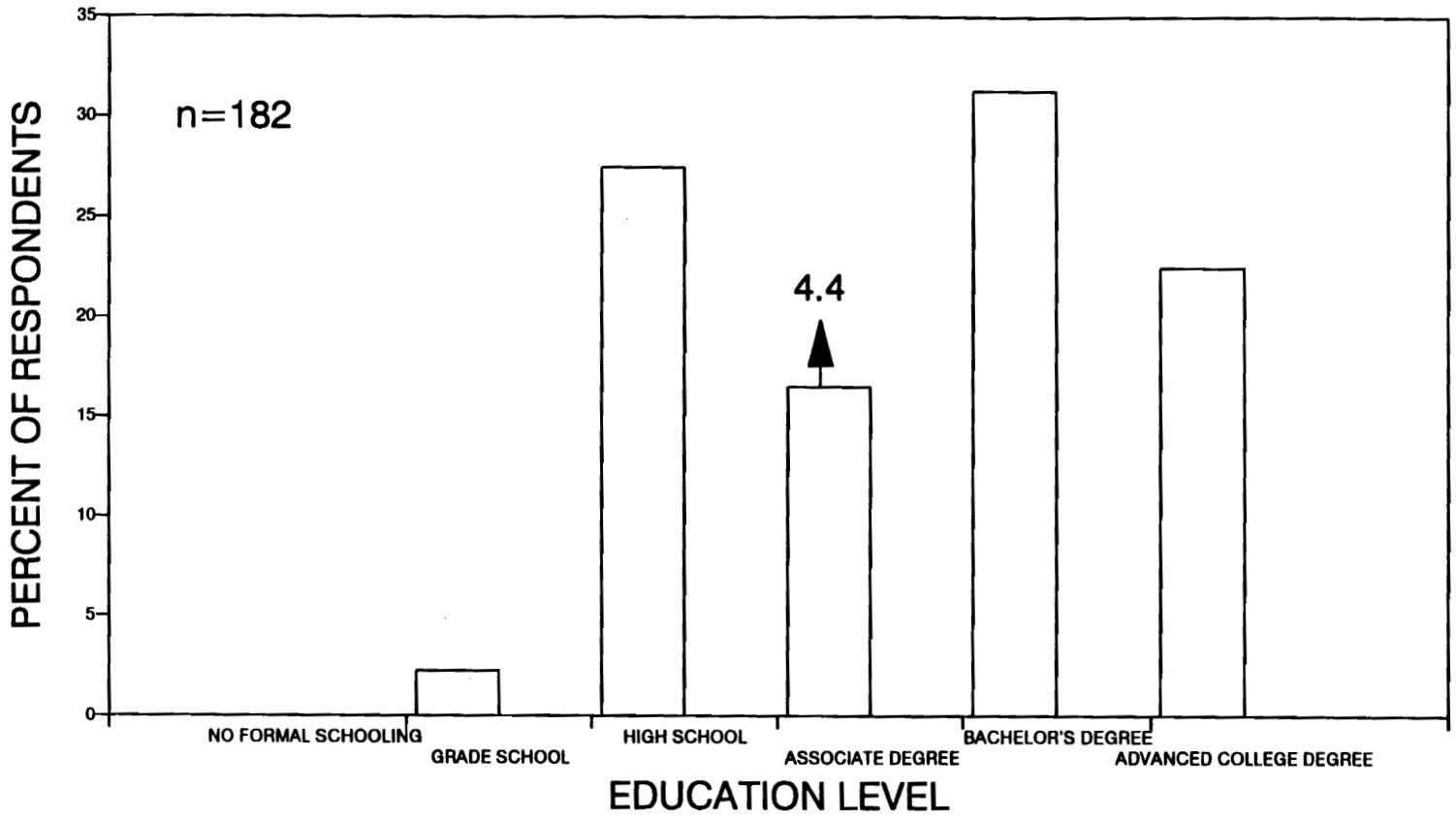

Figure 42. Highest level of education completed or currently enrolled in by spouse of respondent from among VA FSP participants from 1991 through 1993 (arrow represents mean education level based on numeric conversion where no formal schooling = 1, grade school = 2, high school = 3, associate degree = 4, Bachelor's degree = 5, and advanced college degree = 6).

administrative regions, or physiographic regions, respectively, for age (K-W X^2 = 3.665, df = 2, $\underline{P}$ = 0.160; K-W X^2 = 8.604, df = 5, $\underline{P}$ = 0.126; K-W X^2 = 1.434, df = 2, $\underline{P}$ = 0.488), highest level of education currently enrolled in or completed (K-W X^2 = 3.796, df = 2, $\underline{P}$ = 0.150; K-W X^2 = 10.523, df = 5, $\underline{P}$ = 0.062; K-W X^2 = 0.226, df = 2, $\underline{P}$ = 0.893), or current marital status of respondents (K-W X^2 = 0.932, df = 2, $\underline{P}$ = 0.628; K-W X^2 =3.699, df = 5, $\underline{P}$ = 0.594; K-W X^2 =3.457, df = 2, $\underline{P}$ = 0.178).

Most respondents reported a net household income (after federal and state taxes) within the $25,000 - 49,000 range (31.6%, $\underline{n}$ = 196) (Table 8) and were raised in suburban environments (35.3%, $\underline{n}$ = 201) (Figure 43). Net household incomes were greater in administrative Region 3 than administrative Regions 1, 2, 4, and, significantly so, 5 and 6 (K-W X^2 = 14.068, df = 5, $\underline{P}$ = 0.015). Respondents from the Coastal region had higher net household incomes than those in the Piedmont region and, significantly so, the Mountain region (K-W X^2 = 7.656, df = 2, $\underline{P}$ = 0.022). No significant differences among respondents were detected by year for net household income (K-W X^2 = 1.454, df = 2, $\underline{P}$ = 0.483). No significant differences were detected among respondents in their background (environment of upbringing) among years, administrative regions, or physiographic regions (K-W X^2 = 0.185, df = 2, $\underline{P}$ = 0.912; K-W X^2 = 10.274, df = 5, $\underline{P}$ = 0.068; K-W X^2 = 0.752, df = 2, $\underline{P}$ = 0.687, respectively). Respondents reported learning about wildlife and forest resources from literature (e.g., booklets, leaflets, magazines) (91.7%, $\underline{n}$ = 216), their parents or other family members (56.5%), professional or private associations or organizations (47.2%), boy scouts, girl scouts, 4-H, or similar youth group (31.9%), continuing education (28.7%), and formal education or training (22.2%).

Table 8. Approximate net household income (after federal and state taxes) for Virginia Forest Stewardship Program participants from 1991 through 1993, reported as frequency of responses.

	Net Household Income						
	<$25,000	$25,000 - 49,000	$50,000 - 74,999	$75,000 - 99,999	$100,000 - 124,999	$125,000 - 150,000	>$150,000
Overall	18	62	53	26	12	9	16
Year							
1991 A[a]	2	15	12	9	4	1	3
1992 A	5	19	13	7	3	3	4
1993 A	11	21	22	7	3	4	5
Administrative Region							
1 AB	3	5	6	4	1	1	1
2 AB	1	3	3	4	0	0	2
3 AB	2	10	10	7	2	5	9
4 A	4	8	10	3	1	2	2
5 B	5	28	21	7	7	1	2
6 B	3	6	3	1	1	0	0
Physiographic Region							
Mountain A	6	30	20	8	6	1	1
Piedmont AB	11	24	25	10	5	7	12
Coastal B	1	6	8	8	1	1	3

[a] Among Years, Administrative Regions, and Physiographic Regions, income is not different ($P < 0.05$) for rows denoted by the same capital letter.

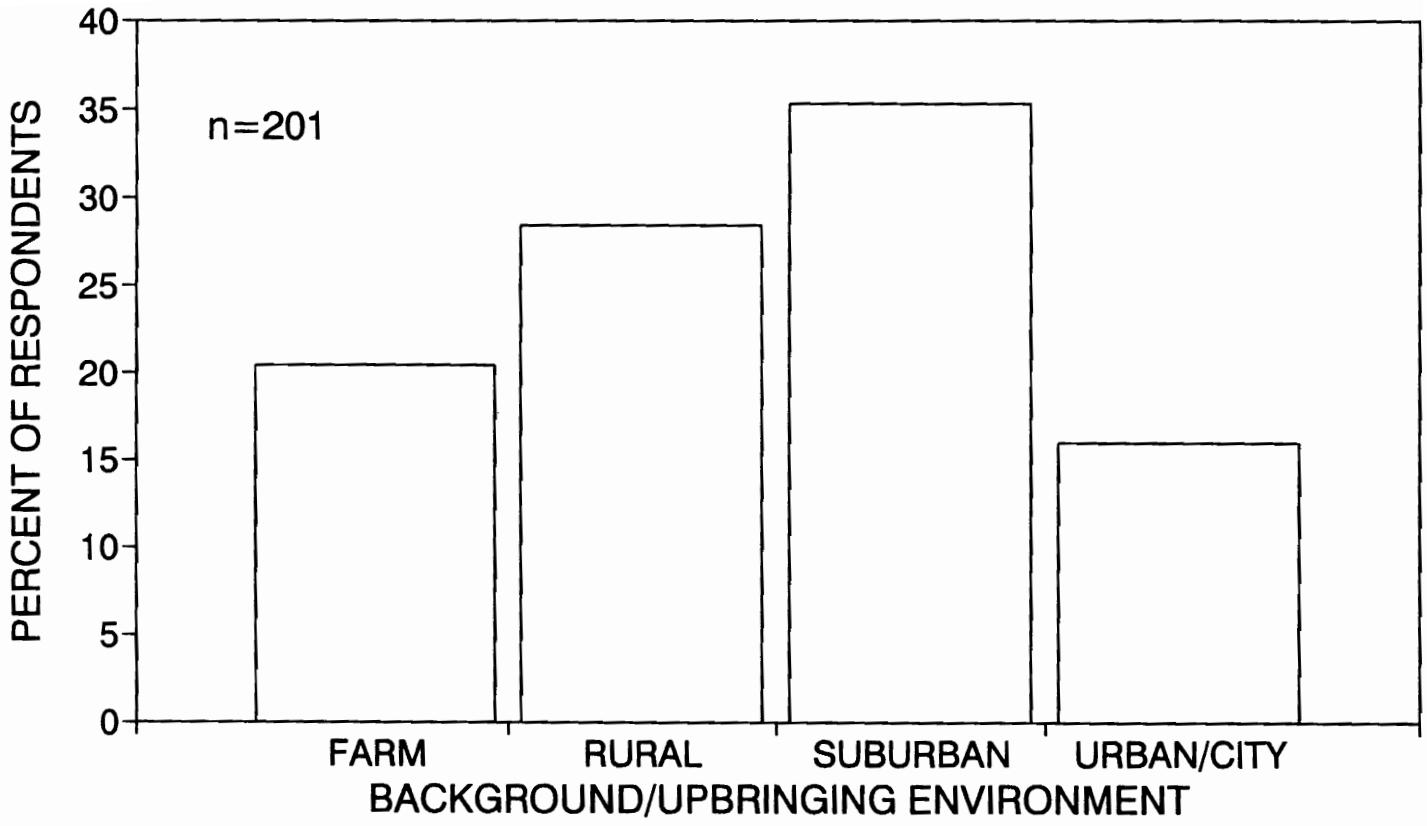

Figure 43. Environment in which VA FSP participants from 1991 through 1993 were raised.

Forest Stewardship Property

Approximately one-half of all respondents (45.1%, $\underline{n}$ = 215) considered the property for which their Virginia forest stewardship plan had been prepared as the site of their main residence. The percentage of respondents who identified the site of their main residence as their stewardship property did not differ among years, administrative regions, or physiographic regions (K-W X^2 = 2.407, df = 2, $\underline{P}$ = 0.300; K-W X^2 = 2.961, df = 5, $\underline{P}$ = 0.706; K-W X^2 = 2.570, df = 2, $\underline{P}$ = 0.277, respectively). For respondents who did not consider their stewardship property and their main residence to be the same, the mean distance from main residence to stewardship property was 177.7 $\pm$ 48.3 km (range: <2 to 4,506 km, $\underline{n}$ = 116) (see Appendix F). The mean distance from main residence to stewardship property did not differ among years, administrative regions, or physiographic regions (K-W X^2 = 0.483, df = 2, $\underline{P}$ = 0.786; K-W X^2 = 4.509, df = 5, $\underline{P}$ = 0.479; K-W X^2 = 2.257, df = 2, $\underline{P}$ = 0.324, respectively).

Some respondents not only did not reside on their stewardship property, but did not reside in Virginia. Approximately 13% of respondents were currently residing in states other than Virginia, including Arizona, Florida, Maryland, Montana, North Carolina, New Jersey, Pennsylvania, South Carolina, and Tennessee.

Respondents ($\underline{n}$ = 206) stated that they collectively owned 1,272 ha ($\bar{x}$ = 6 $\pm$ 2 ha/landowner; range: 0 to 283 ha) of forested land in states other than Virginia. Respondents who owned forested land in other states ($\underline{n}$ = 32) enrolled 532 ha ($\bar{x}$ = 17 $\pm$ 9 ha/landowner; range: 0 to 283 ha) of that land in FSPs in those states.

The total land area in Virginia owned by all respondents was 21,903 ha ($\bar{x}$ = 100 $\pm$ 9 ha/landowner; range: 8 to 1,214 ha; $\underline{n}$ = 219) (Figure 44). Respondents who entered Virginia's FSP in 1991 individually owned significantly more land (120 $\pm$ 15 ha) than those who entered in 1992 (85 $\pm$ 14 ha) or 1993 (76 $\pm$ 10 ha) (K-W X^2 = 11.150, df = 2, $\underline{P}$ = 0.004). Respondents from within the Coastal region owned more land in Virginia ($\bar{x}$ = 125 $\pm$ 27 ha/respondent) than those in the Piedmont region ($\bar{x}$

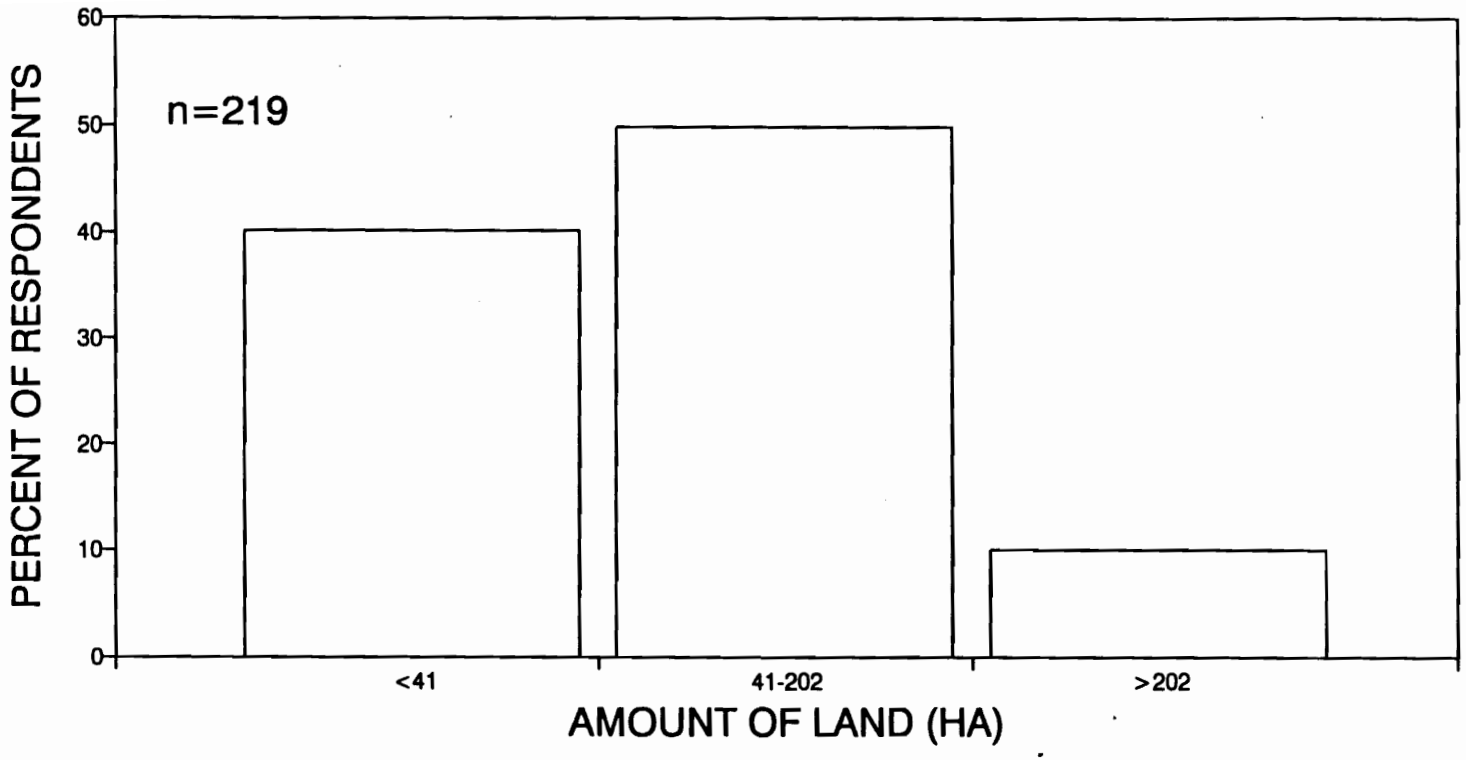

Figure 44. Size of total land holding in Virginia owned by VA FSP participants from 1991 through 1993.

= 115 ± 15 ha/respondent) and the Mountain region ($\bar{x}$ = 65 ± 8 ha/respondent). However, when I tested for significant differences among physiographic regions, the mean rank sum for the Piedmont region was greater than that for the Coastal region and, significantly so, that for the Mountain region (K-W X^2 = 9.915, df = 2, $\underline{P}$ = 0.007). This discrepancy in ranking most likely was due to the larger range of land holding sizes in the Piedmont region. No significant differences among respondents in amount of land owned in Virginia were detected among administrative regions (K-W X^2 =6.968, df = 5, $\underline{P}$ = 0.223). Of that 21,903 ha of land in Virginia, forests covered 15,868 ha ($\bar{x}$ = 73 ± 7 ha/landowner; range: 4 to 1,012 ha; $\underline{n}$ = 218). Respondents who entered Virginia's FSP in 1991 individually owned significantly more forested land in Virginia than those in either 1992 or 1993 (K-W X^2 = 13.535, df = 2, $\underline{P}$ = 0.001). No significant differences were detected in the amount of forested land owned in Virginia among administrative or physiographic regions (K-W X^2 = 4.512, df = 5, $\underline{P}$ = 0.478; K-W X^2 = 5.489, df = 2, $\underline{P}$ = 0.064, respectively).

The total area of land owned in Virginia enrolled in the FSP was 14,676 ha ($\bar{x}$ = 69 ± 6 ha/landowner; range: 2 to 607 ha; $\underline{n}$ = 213) (Figure 45). Landowners who entered the FSP in 1991 enrolled significantly more area in the FSP than those in either 1992 or 1993 (K-W X^2 = 11.446, df = 2, $\underline{P}$ = 0.003). Similarly, landowners in the Coastal and Piedmont regions enrolled significantly more area in the FSP than those in the Mountain region (K-W X^2 = 10.558, df = 2, $\underline{P}$ = 0.005). No significant differences were detected among administrative regions in the amount of land in Virginia enrolled in the FSP (K-W X^2 = 8.469, df = 5, $\underline{P}$ = 0.132). Respondents with >$150,000 net household income enrolled more land in stewardship than those individuals earning ≤$150,000 (K-W X^2 = 12.261, df = 4, $\underline{P}$ = 0.016). The amount of land area enrolled in FSP did not differ with sex of respondent (M-W $\underline{Z}$ = -1.338, $\underline{P}$ = 0.181), their age (K-W X^2 = 3.792, df = 2), education (K-W X^2 = 0.523, df = 2, $\underline{P}$ = 0.770), marital status (M-W $\underline{Z}$ = 0.322, $\underline{P}$ = 0.748), or background (K-W X^2 = 3.507, df = 3, $\underline{P}$ = 0.320). The average percentage of total land holdings owned in

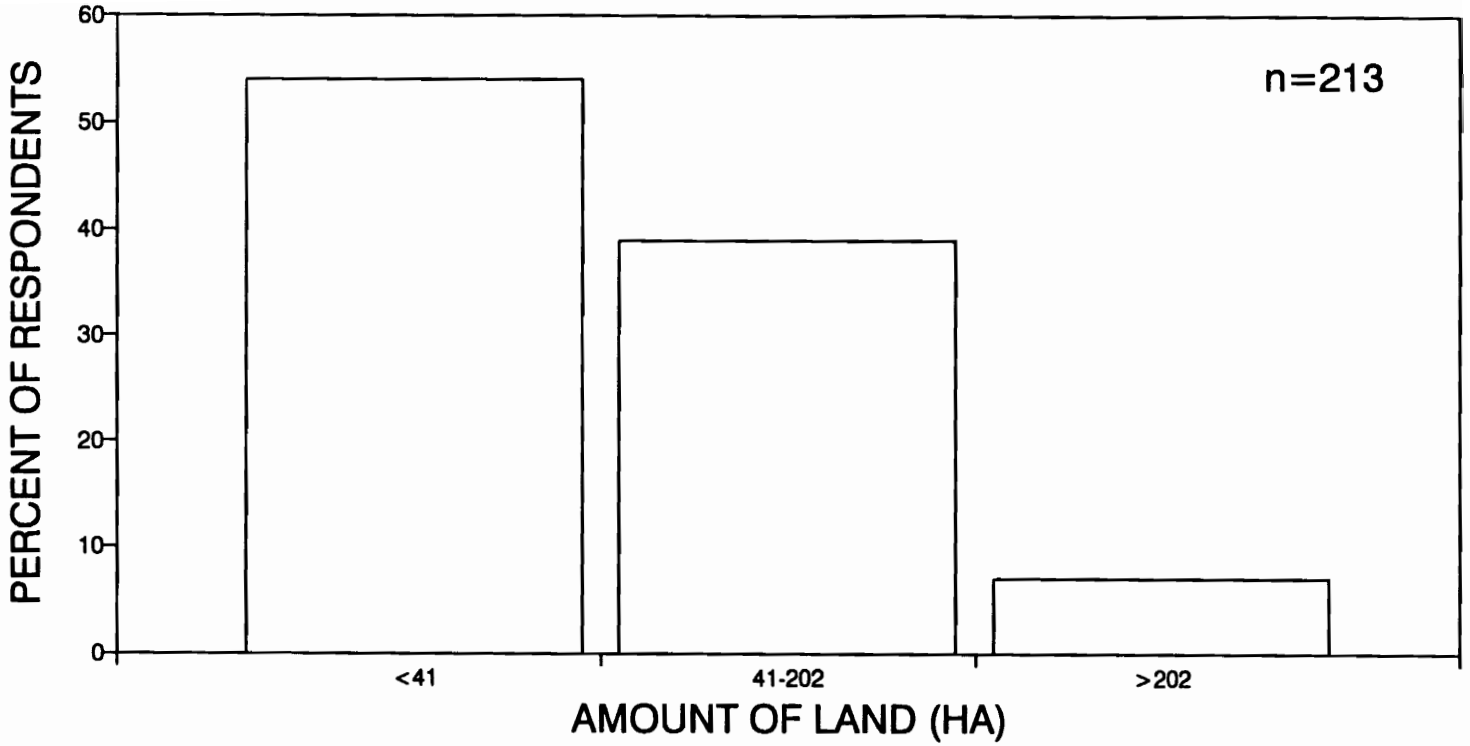

Figure 45. Amount of land holdings enrolled in VA FSP by participants from 1991 through 1993.

Virginia by respondents which they included in the FSP was 74.4 $\pm$ 2.0% ($\underline{n}$ = 211) (Figure 46). Percentage of total land holdings included in the FSP appeared to differ among administrative regions (K-W X^2 = 11.818, df = 5, $\underline{P}$ = 0.037), however, multiple comparison tests could not identify such differences. Differences in the percentage of land holdings included in the FSP among years and physiographic regions were not detected (K-W X^2 = 1.265 df = 2, $\underline{P}$ = 0.531; K-W X^2 = 0.099, df = 2, $\underline{P}$ = 0.952 respectively). Similarly, there were no differences in the percentage of land holdings included in the FSP by respondent's sex (M-W $\underline{Z}$ = -0.606, $\underline{P}$ = 0.545), age (K-W X^2 = 2.232, df = 2, $\underline{P}$ = 0.328), education (K-W X^2 = 0.095, df = 2, $\underline{P}$ = 0.954), marital status (M-W $\underline{Z}$ = -1.065, $\underline{P}$ = 0.287), net household income (K-W X^2 = 2.359, df = 4, $\underline{P}$ = 0.670), nor background (K-W X^2 = 2.410, df = 3, $\underline{P}$ = 0.491).

The average length of ownership or control of property for which a stewardship plan was prepared was 11 $\pm$ 1 years (range: 1 to 150 years, $\underline{n}$ = 220) (Figure 47). Respondents who entered the FSP in 1991 had owned their stewardship property longer than those in 1992 and, significantly so, those in 1993 (K-W X^2 = 12.724, df = 2, $\underline{P}$ = 0.002). No significant differences were detected among administrative or physiographic regions in the length of ownership of the stewardship property (K-W X^2 = 3.576, df = 5, $\underline{P}$ = 0.612; K-W X^2 = 0.801, df = 2, $\underline{P}$ = 0.670, respectively). Length of ownership was greater for respondents with advanced college degrees than for those with associate or Bachelor's degrees and, significantly so, those with grade school or high school education (K-W X^2 = 10.300, df = 2, $\underline{P}$ = 0.006). Respondents who were married had owned their stewardship properties longer than those who currently were unmarried (M-W $\underline{Z}$ = -2.870, $\underline{P}$ = 0.004). I found no relationship between length of ownership of the stewardship property and the respondent's sex (M-W $\underline{Z}$ = -0.418, $\underline{P}$ = 0.676), net household income (K-W X^2 = 7.510, df = 4, $\underline{P}$ = 0.111), or background (K-W X^2 = 4.180, df = 3, $\underline{P}$ = 0.243).

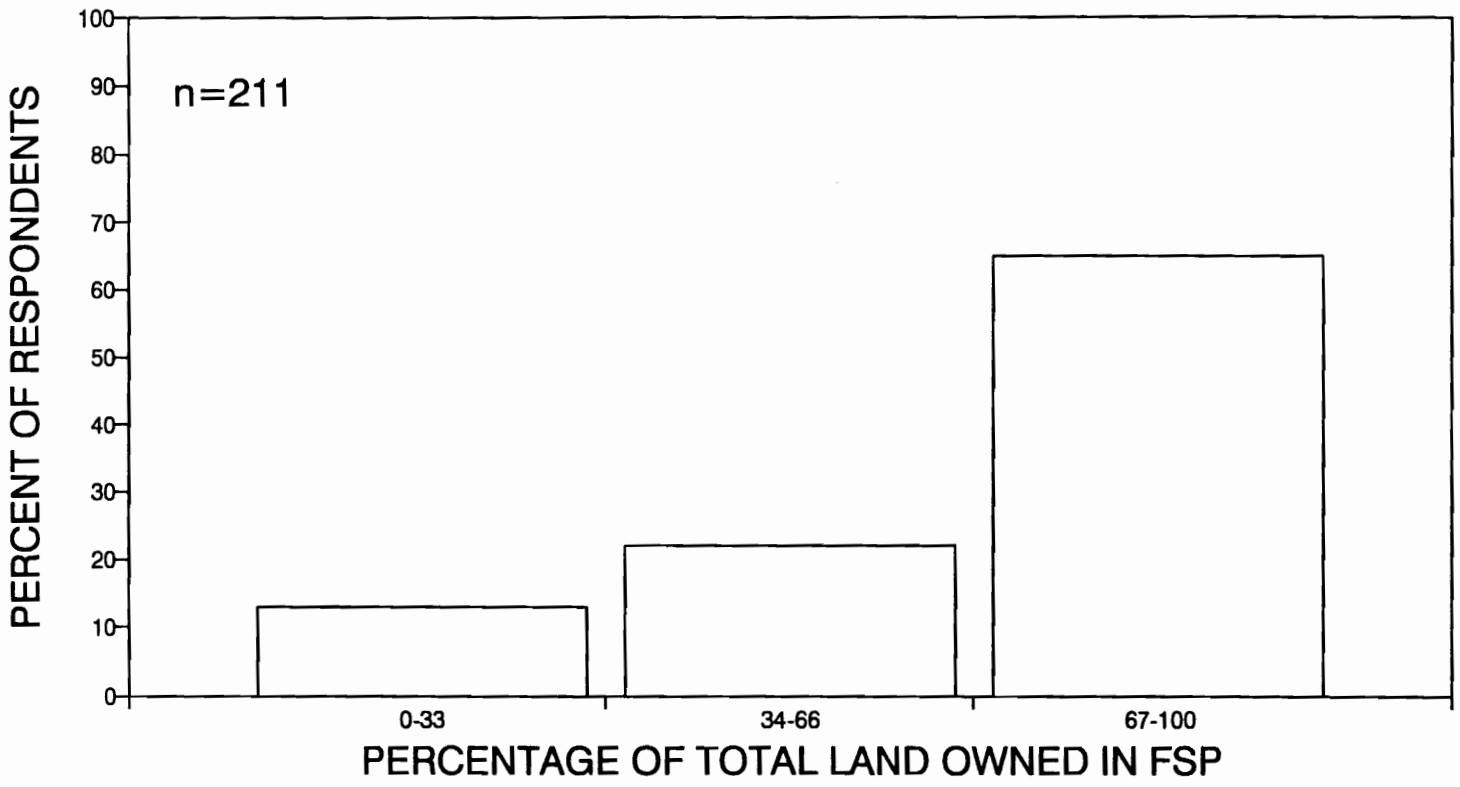

Figure 46. Percentage of total land holdings owned in Virginia included in the FSP as reported by VA FSP participants from 1991 through 1993.

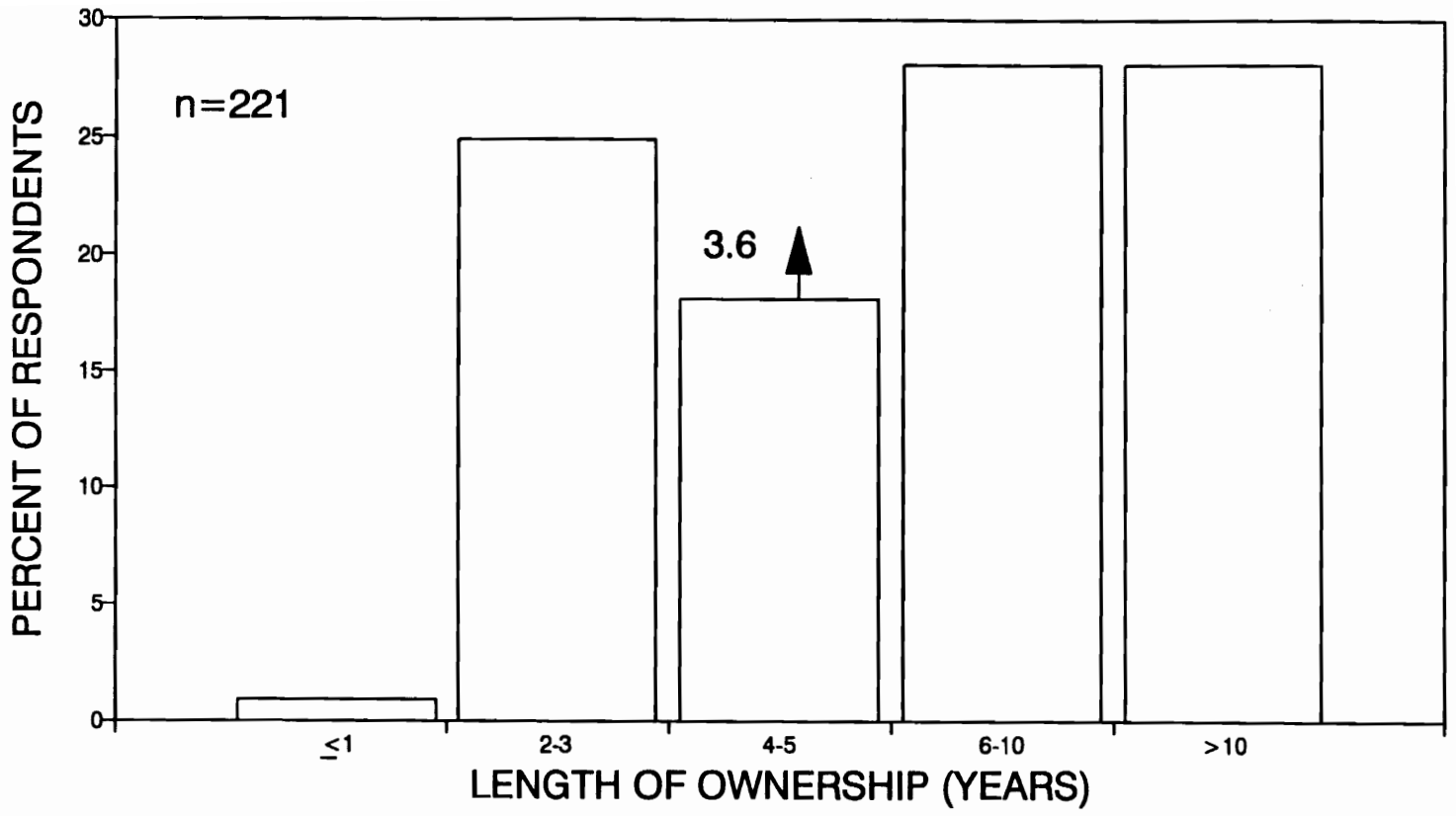

Figure 47. Length of time that VA FSP participants from 1991 through 1993 have owned or had direct management control of their stewardship property, expressed as percent of respondents (arrow represents mean length of ownership based on numeric conversion where ≤1 year = 1, 2-3 years = 2, 4-5 years = 3, 6-10 years = 4, and >10 years = 5).

According to respondents, the majority of stewardship properties in Virginia were owned jointly by husbands and wives (55.8%, $\underline{n}$ = 217). Sole ownership, family partnerships, non-family partnerships, family corporations, and non-family corporations also existed, though less frequently (23%, 11.1%, 5.5%, 2.8%, 1.8% respectively). Ownership patterns were consistent among years, administrative regions, and physiographic regions (K-W X^2 = 1.343, df = 2, $\underline{P}$ = 0.511; K-W X^2 = 3.639, df = 5, $\underline{P}$ = 0.602; K-W X^2 = 0.951, df = 2, $\underline{P}$ = 0.622, respectively).

When asked how often they visited their stewardship properties specifically to conduct natural resource management activities, most respondents (52.8%, $\underline{n}$ = 216) stated >30 days per year (Figure 48). Visitation rate did not differ among years, administrative regions, or physiographic regions (K-W X^2 = 0.253, df = 2, $\underline{P}$ = 0.881; K-W X^2 = 2.088, df = 5, $\underline{P}$ = 0.837; K-W X^2 = 0.170, df = 2, $\underline{P}$ = 0.918, respectively). Visitation rate also was not related to the respondent's sex (X^2 = 3.683, df = 2, $\underline{P}$ = 0.159), age (X^2 = 8.463, df = 4, $\underline{P}$ = 0.076), education level (X^2 = 0.345, df = 4, $\underline{P}$ = 0.987), marital status (X^2 = 0.468, df = 2, $\underline{P}$ = 0.791), net household income (X^2 = 13.092, df = 8, $\underline{P}$ = 0.109), nor background (X^2 = 2.324, df = 6, $\underline{P}$ = 0.888). Visitation rate also was not affected by distance from main residence to stewardship property (K-W X^2 = 3.839, df = 2, $\underline{P}$ = 0.147), the amount of land owned in Virginia enrolled in the FSP (K-W X^2 = 2.853, df = 2, $\underline{P}$ = 0.240), or length of ownership of the stewardship property (K-W X^2 = 1.345, df = 2, $\underline{P}$ = 0.510). Regression analysis confirmed that there was no significant relationship between the visitation rate and amount of land owned in Virginia enrolled in the FSP (regression equation: 3.94 + 0.00167 (amount of land owned in Virginia enrolled in the FSP); r^2 = 0.008; df = 1; $\underline{P}$ = 0.110).

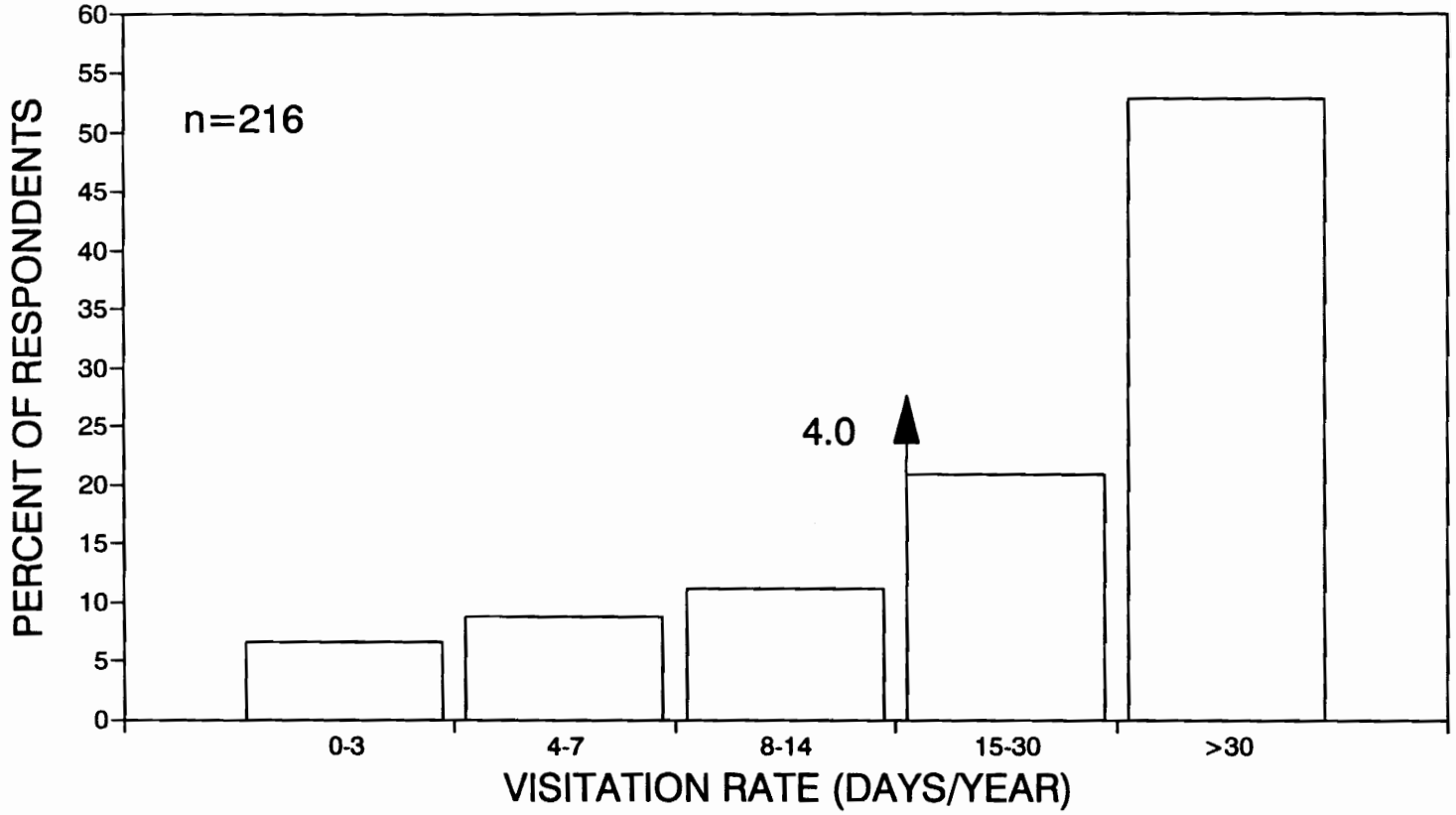

Figure 48. Number of days per year that VA FSP participants from 1991 through 1993 visited their Virginia stewardship property specifically to conduct natural resource management activities, expressed as percent of respondents (arrow represents mean days per year based on numeric conversion where 0-3 days = 1, 4-7 days = 2, 8-14 days = 3, 15-30 days = 4, and >30 days = 5).

The Forest Stewardship Program

Prior to their involvement with the Virginia FSP, 50% of all respondents (n = 220) had received professional advice about managing their forested property. A greater portion of respondents who first enrolled in the FSP in 1991 previously had received advice than did those in 1992 and 1993 (K-W X^2 = 15.121, df = 2, P = 0.001). Respondents in the Mountain region typically had not received advice prior to the FSP whereas those in the Piedmont and Coastal regions had (K-W X^2 = 16.221, df = 2, P = 0.000). Requests for prior professional advice were unrelated to the administrative region within which the stewardship property was located (K-W X^2 = 10.872, df = 5, P = 0.054). However, whether advice previously had been received was dependent on the amount of land owned in Virginia (X^2 = 23.287, df = 2, P = 0.000). Advice was received more often than expected by respondents who owned >202 ha (cell X^2 = 4.455, df = 1, P <0.05) end significantly less often than expected by those owning ≤41 ha (cell X^2 = 5.689, df = 1, P <0.05). Respondents who previously had received advice had owned their stewardship property longer than those who had not received advice (M-W Z = -3.383, P = 0.001). Whether advice previously had been received was not related to the respondent's sex (X^2 = 1.608, df = 1, P = 0.205), age (X^2 = 3.810, df = 2, P = 0.149), education (X^2 = 5.532, df = 2, P = 0.063), net household income (X^2 = 3.728, df = 4, P = 0.444), or background (X^2 = 0.359, df = 3, P = 0.949), or to the number of days per year that they visited their stewardship property (X^2 = 1.128, df = 2, P = 0.569).

Respondents indicated that they previously received professional advice mostly from VDOF (77.1%, n = 109), but also relied on Virginia Department of Game and Inland Fisheries (VDGIF) (40.4%), SWCD (38.5%), private professional consultants (37.6%), university or cooperative extension service (24.8%), others (19.3%) (e.g., family, friends, neighbors, farmers, industry, landlords, community college courses), and the Natural Heritage Program of Virginia (NHP) (0.9%). Respondents indicated

that they sought help with wildlife resources (68.8%), timber resources (64.2%), preparation of comprehensive forest management plans (63.3%), erosion control/soil conservation (32.1%), water conservation (24.8%), fisheries resources (22%), or other information (10.1%) (e.g., mining, plant resources, recreation, and SIP information).

Most respondents had first heard about Virginia's FSP from VDOF (59.8%, n = 214). Other sources providing information about the FSP included newspapers/ magazines (12.6%), friends/relatives (10.7%), others (8.9%) (e.g., NRCS or SWCD personnel, professional consultants, Virginia Wildlife Federation, U.S. Forest Service, Turkey Federation, industry, Ruffed Grouse Society, landlord, and Kentucky Extension Agent), and other state agencies (7.9%).

Forest Stewardship Plans

Landowner Objectives

Respondents' rankings (where 1 represented the highest and 8 the lowest priority) of their general objectives were: 1--wildlife and fisheries ($\bar{x} = 1.6 \pm 0.1$), 2--timber ($\bar{x} = 2.9 \pm 0.2$), 3--recreational and esthetic ($\bar{x} = 3.6 \pm 0.2$), 4--water or wetlands conservation ($\bar{x} = 4.5 \pm 0.2$), 5--soils ($\bar{x} = 5.0 \pm 0.2$), 6.5--tie between non-timber plant resources ($\bar{x} = 5.7 \pm 0.2$) and T&E species ($\bar{x} = 5.7 \pm 0.2$), 8--historical and cultural interests, such as Native American and archeological ($\bar{x} = 7.1 \pm 0.1$) (n = 118). Almost 60% of respondents ranked wildlife and fisheries as their highest priority (n = 184).

Regarding specific wildlife objectives, respondents chose general wildlife improvements, such as "more and better" wildlife or improvements just to know animals are around, more often (64.9%) than either wildlife enhancement for consumptive (21.3%) or non-consumptive uses (13.7%) (n = 211). No significant differences among respondents were detected in the type of wildlife objective among years, administrative regions, or physiographic regions (K-W $X^2 = 0.628$, df = 2, P

= 0.731; K-W X^2 = 1.499, df = 5, P = 0.913; K-W X^2 = 0.290, df = 2, P = 0.865, respectively). Wildlife objective type differed by sex of respondent (X^2 = 23.431, P = 0.000); females chose wildlife enhancement for consumptive and non-consumptive uses less often than expected (cell X^2 = 5.4, 15.211, respectively, df = 1, P<0.05). Respondents who chose wildlife enhancement for consumptive uses had higher net household incomes than those who chose wildlife enhancement for non-consumptive uses and, significantly so, general wildlife improvements (K-W X^2 = 10.881, df = 2, P = 0.004). Respondents who chose wildlife enhancement for non-consumptive uses had a greater percentage of their Virginia land holdings included in their stewardship plan than those who chose either wildlife enhancement for consumptive uses or general wildlife improvements (K-W X^2 = 8.618, df = 2, P = 0.013). The type of wildlife objective selected was not related to the respondent's age (X^2 = 6.923, df = 4, P = 0.140), education (X^2 = 9.379, df = 4, P = 0.052), or background (X^2 = 11.885, df = 6, P = 0.065), or to the amount of land owned in Virginia (K-W X^2 = 5.797, df = 2, P = 0.055).

Landowner Satisfaction with Their Stewardship Plan

A majority of stewardship respondents (95.4%, n = 217) believed that they were able to convey clearly to the plan preparer their desired objectives during preparation of their forest stewardship plan (Figure 49). Respondent attitude did not differ among years, administrative regions, or physiographic regions (K-W X^2 = 1,812, df = 2, P = 0.404; K-W X^2 = 0.743, df = 5, P = 0.981; K-W X^2 = 0.477, df = 2, P = 0.788, respectfully). However, response was related to distance from main residence to stewardship property (X^2 = 10.098, df = 2, P = 0.006). Respondents who lived >402.3 km from their stewardship properties did not believe that they were able to clearly convey to the plan preparer their desired objectives significantly more often than expected (cell X^2 = 8.1, df = 1, P<0.05). Respondent attitude was not related to the amount of land owned in Virginia enrolled in the FSP (M-W Z = -0.807,

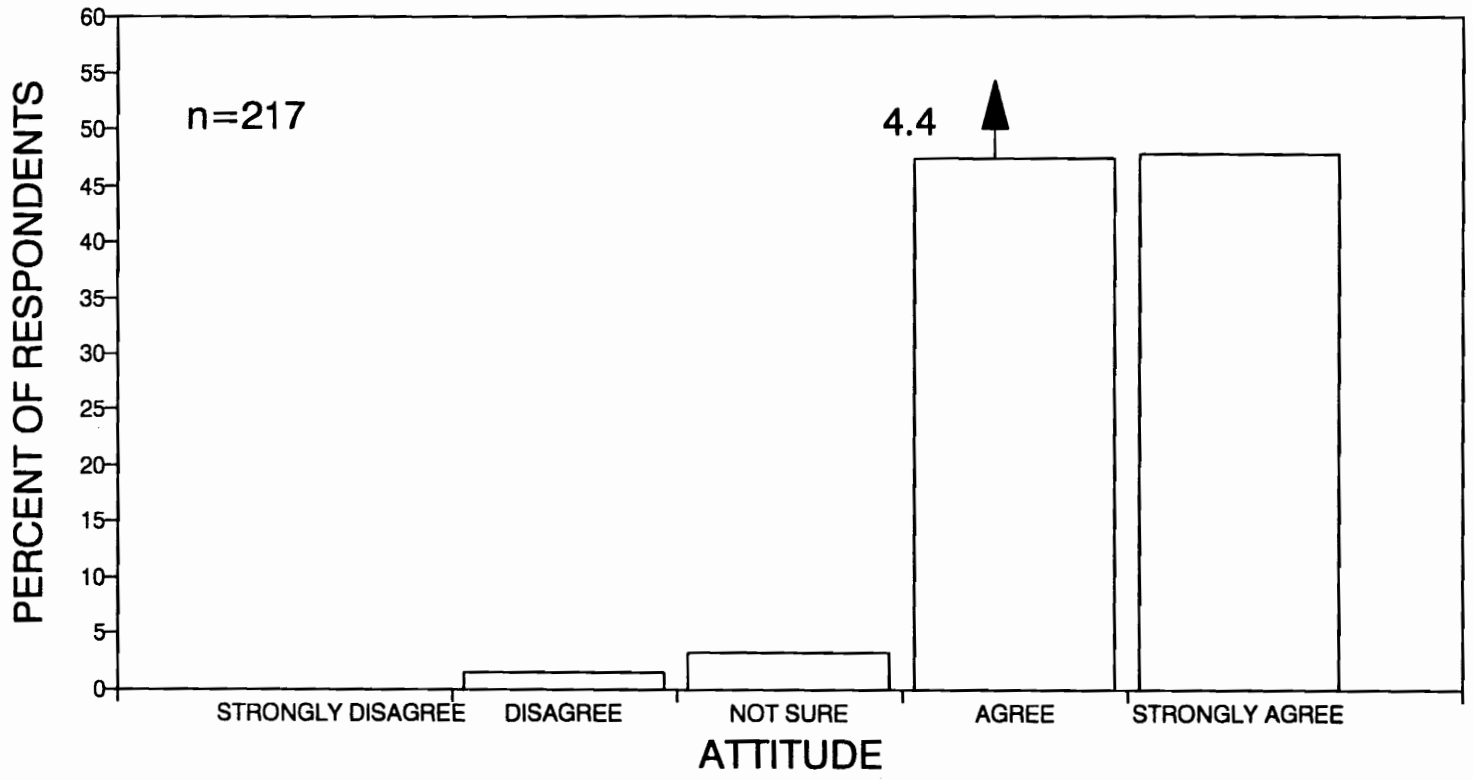

Figure 49. Expressed attitude of VA FSP participants from 1991 through 1993 to the statement, "I had the opportunity to clearly convey my desired objectives during the preparation of my forest stewardship plan" (arrow represents mean respondent attitude based on numeric conversion where strongly disagree = 1, disagree = 2, not sure = 3, agree = 4, and strongly agree = 5).

$\underline{P}$ = 0.420), percentage of total land holdings owned in Virginia included in the FSP (M-W $\underline{Z}$ = -0.336, $\underline{P}$ = 0.737), or length of ownership of the stewardship property (M-W $\underline{Z}$ = -0.850, $\underline{P}$ = 0.395). Cell-sample-size assumptions could not be met for contingency table X^2 tests (>20% of cell expected frequencies were <5) and tests of independence ($\underline{P}$>0.05) between respondent's attitude and their sex, age, education, background, visitation rate, whether professional advice previously had been received, and who prepared their stewardship plan. Thus, the existence of any relationships between these variables remains unclear.

Respondents agreed (88.9%, n = 217) (Figure 50) with the statement "The person who prepared my forest stewardship plan clearly communicated with me during the planning process of my stewardship plan" (see Appendix E, question 29). Respondent attitude did not differ among years, administrative regions, or physiographic regions (K-W X^2 = 0.772, df = 2, $\underline{P}$ = 0.680; K-W X^2 = 1.358, df = 5, $\underline{P}$ = 0.929; K-W X^2 = 0.022, df = 2, $\underline{P}$ = 0.989, respectively). However, response was related to income (X^2 = 9.580, df = 4, $\underline{P}$ = 0.048). Respondents with a net household income of $100,000 - $150,000 disagreed with this statement significantly more often than expected (cell X^2 = 6.530, df = 1, $\underline{P}$<0.05). Response was not related to the amount of land owned in Virginia enrolled in the FSP (M-W $\underline{Z}$ = -0.218, $\underline{P}$ = 0.828), percentage of total land holdings owned in Virginia included in the FSP (M-W $\underline{Z}$ = -1.925, $\underline{P}$ = 0.054), length of ownership of the stewardship property (M-W $\underline{Z}$ = -0.187, $\underline{P}$ = 0.852), nor whether professional advice previously had been received (X^2 = 9.580, df = 4, $\underline{P}$ = 0.370). As before, small cell sample sizes precluded meeting assumptions for contingency table and independence tests. Therefore, I was unable to ascertain any relationship between respondent's attitude and their sex, age, education, and background, and who prepared their stewardship plan.

Respondents were pleased with the plans they received (94.9%, $\underline{n}$ = 215) (Figure 51). Again, respondent attitude did not differ among years, administrative regions, or physiographic regions (K-W X^2 = 1.513, df = 2, $\underline{P}$ = 0.470; K-W X^2 =

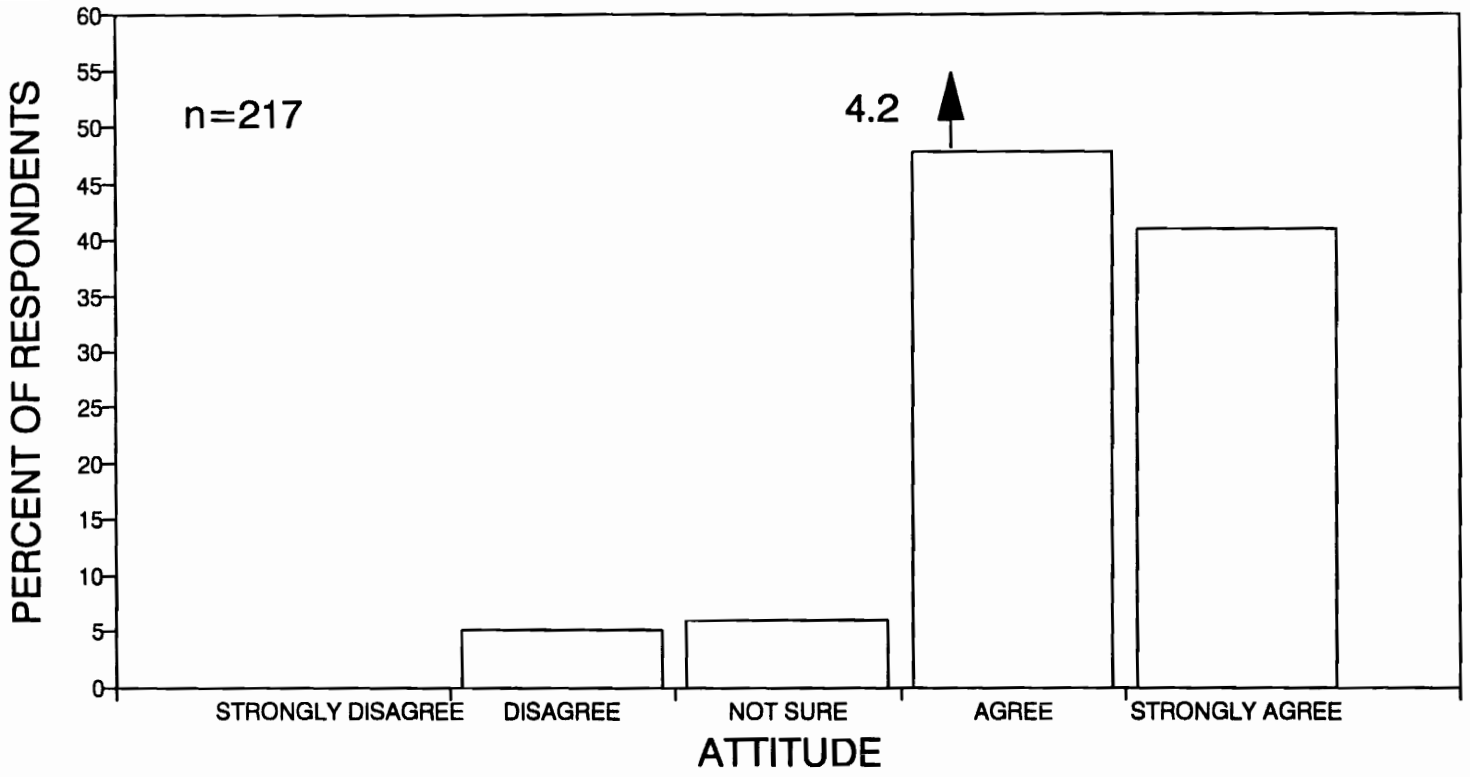

Figure 50. Expressed attitude of VA FSP participants from 1991 through 1993 to the statement, "The person who prepared my forest stewardship plan clearly communicated with me during the planning process of my stewardship plan" (arrow represents mean respondent attitude based on numeric conversion where strongly disagree = 1, disagree = 2, not sure = 3, agree = 4, and strongly agree = 5).

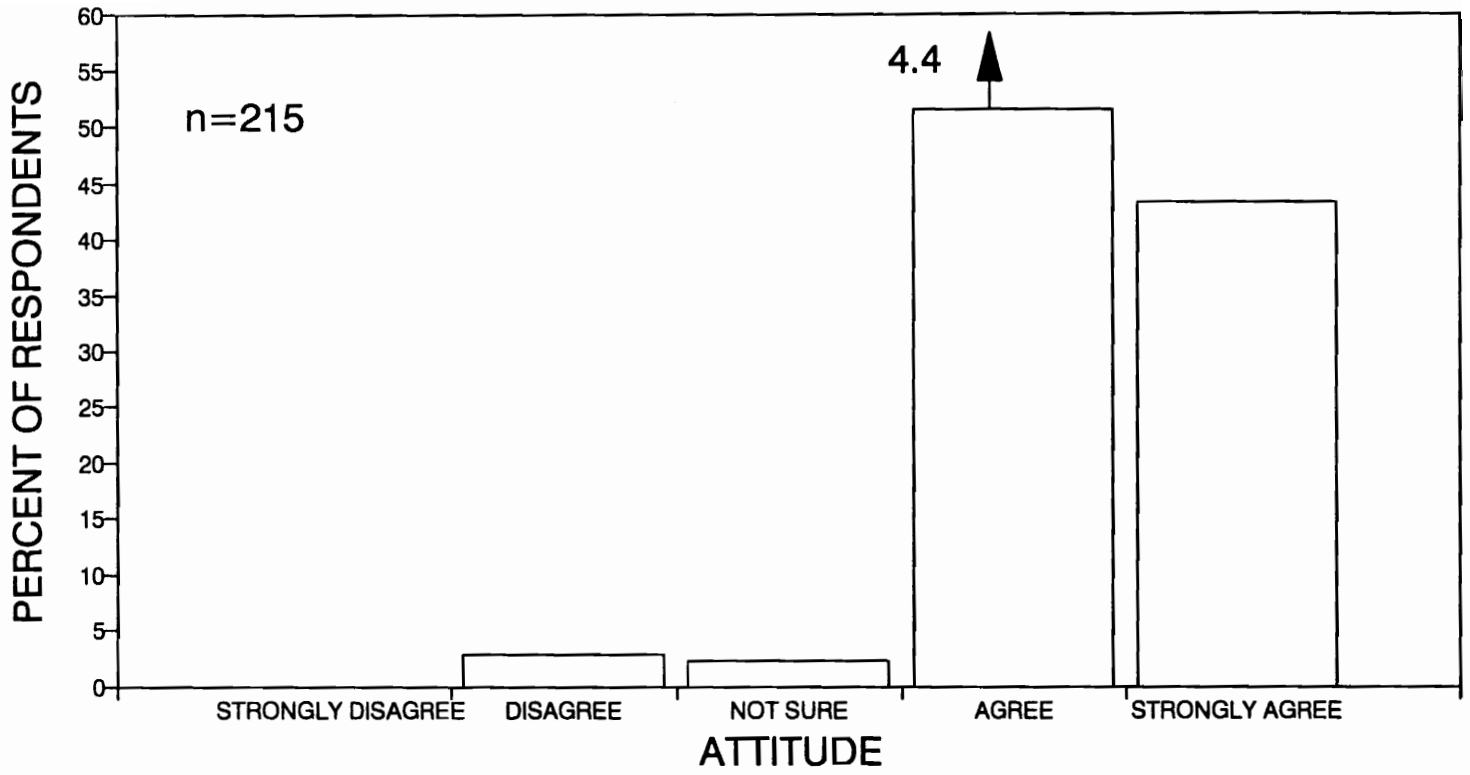

Figure 51. Expressed attitude of VA FSP participants from 1991 through 1993 to the statement, "I was pleased with the plan I received" (arrow represents mean respondent attitude based on numeric conversion where strongly disagree = 1, disagree = 2, not sure = 3, agree = 4, and strongly agree = 5).

8.300, df = 5, $\underline{P}$ = 0.141; K-W X^2 = 0.532, df = 2, $\underline{P}$ = 0.767, respectively). No significant differences were detected in respondent attitude in the amount of land owned in Virginia enrolled in the FSP (M-W $\underline{Z}$ = -0.057, $\underline{P}$ = 0.955), percentage of total land holdings owned in Virginia included in the FSP (M-W $\underline{Z}$ = -0.885, $\underline{P}$ = 0.376), and length of ownership of the stewardship property (M-W $\underline{Z}$ = -0.079, $\underline{P}$ = 0.937). Assumptions could not be met for contingency table X^2 tests for comparisons between respondent's attitude and their sex, age, education, net household income, and background, or whether professional advice previously had been received, and who prepared their stewardship plan.

Respondents overwhelmingly agreed (94.5%, $\underline{n}$ = 216) (Figure 52) with the statement "The recommendations offered in the plan were easy for me to understand" (see Appendix E, question 31). Respondent attitude did not differ among years, administrative regions, or physiographic regions (K-W X^2 = 2.359, df = 2, $\underline{P}$ = 0.307; K-W X^2 = 4.851, df = 5, $\underline{P}$ = 0.434; K-W X^2 = 3.465, df = 2, $\underline{P}$ = 0.177, respectively). Response to this statement was related to sex of respondent (X^2 = 5.092, df = 1, $\underline{P}$ = 0.024). Females disagreed with this statement significantly more than expected (cell X^2 = 4.5, df = 1, $\underline{P}<0.05$). Respondent attitude was not related to the amount of land owned in Virginia enrolled in the FSP (M-W $\underline{Z}$ = -0.138, $\underline{P}$ = 0.890), percentage of total land holdings owned in Virginia included in the FSP (M-W $\underline{Z}$ = -0.815, $\underline{P}$ = 0.415), nor length of ownership of the stewardship property (M-W $\underline{Z}$ = -0.577, $\underline{P}$ = 0.564). Assumptions could not be met for contingency table X^2 tests for comparisons between responses to this statement and the respondent's age, education, and background, or whether professional advice previously had been received, and who prepared their stewardship plan.

Respondents did not believe that recommendations included in their stewardship plans were impractical or impossible to implement (89.1%, $\underline{n}$ = 211) (Figure 53). Respondent attitude did not differ among years, administrative regions, or physiographic regions (K-W X^2 = 1.704, df = 2, $\underline{P}$ = 0.427; K-W X^2 = 4.369, df =

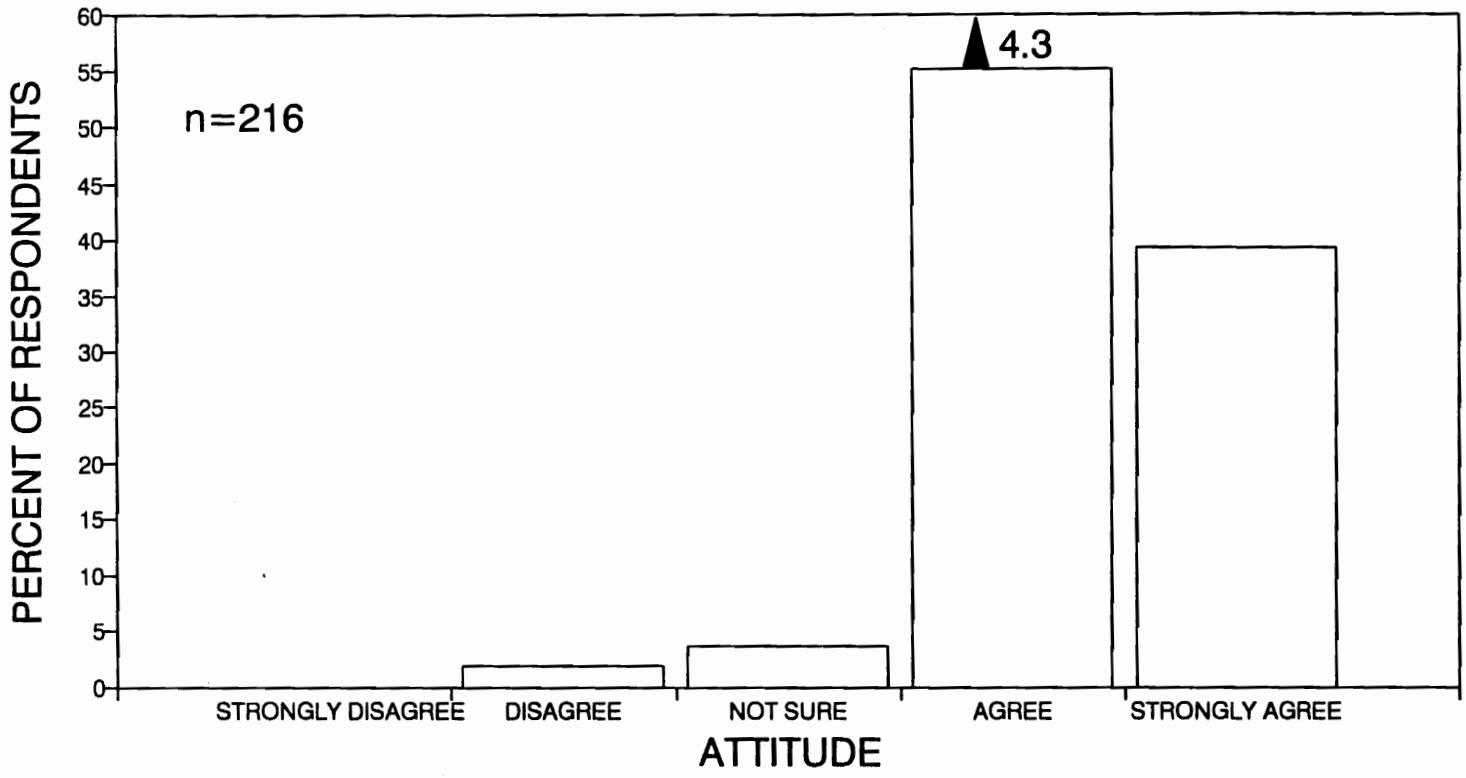

Figure 52. Expressed attitude of VA FSP participants from 1991 through 1993 to the statement, "The recommendations offered in the plan were easy for me to understand" (arrow represents mean respondent attitude based on numeric conversion where strongly disagree = 1, disagree = 2, not sure = 3, agree = 4, and strongly agree = 5).

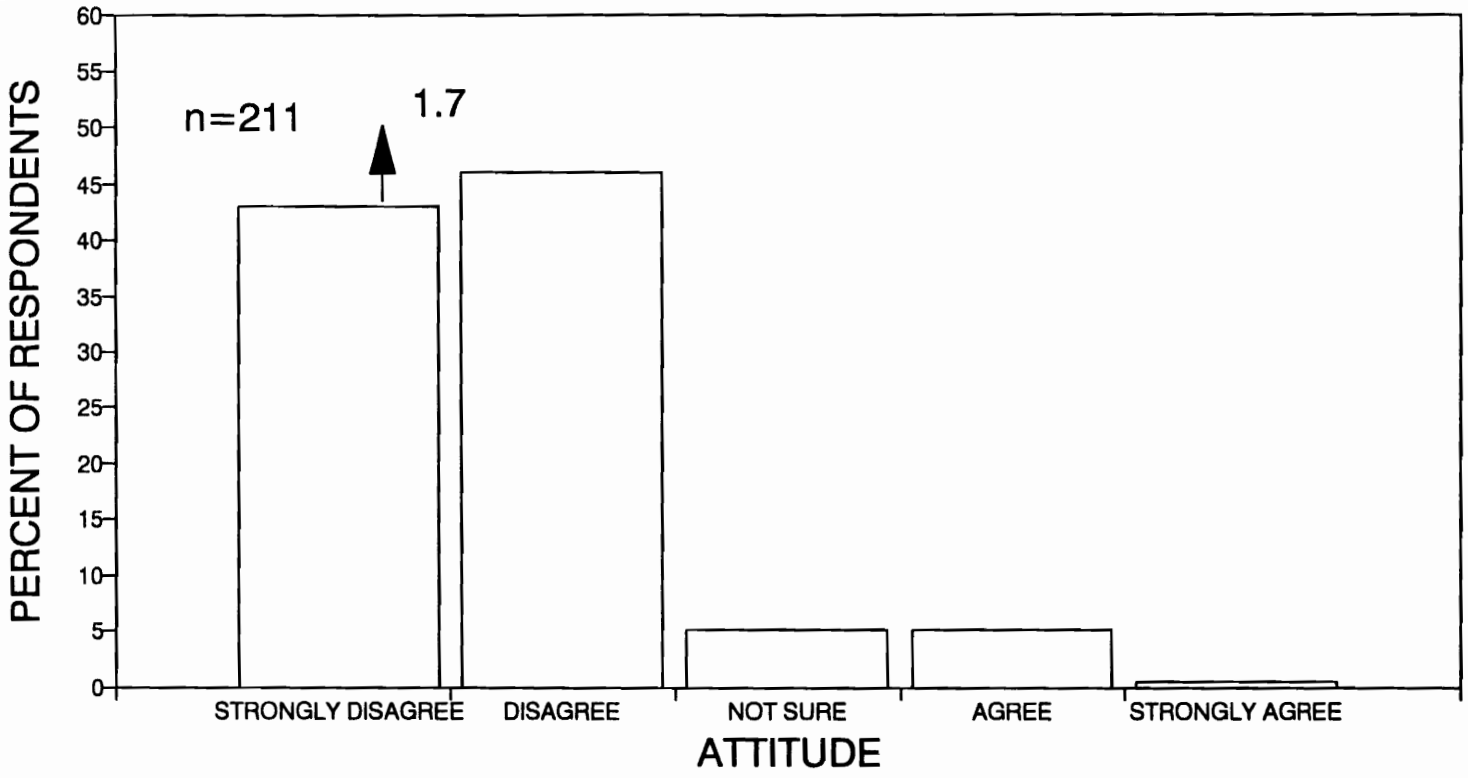

Figure 53. Expressed attitude of VA FSP participants from 1991 through 1993 to the statement, "The recommendations were impractical and almost impossible to implement" (arrow represents mean based on numeric conversion where strongly disagree = 1, disagree = 2, not sure = 3, agree = 4, and strongly agree = 5).

5, $\underline{P}$ = 0.498; K-W X^2 = 2.852, df = 2, $\underline{P}$ = 0.240, respectively). Respondents who believed that the recommendations were impractical had owned their stewardship property significantly longer than those who did not believe so (M-W $\underline{Z}$ = -2.006, $\underline{P}$ = 0.045). Respondent attitude was not related to the amount of land owned in Virginia enrolled in the FSP (M-W $\underline{Z}$ = -0.653, $\underline{P}$ = 0.514), and whether professional advice previously had been received (X^2 <0.001, df = 1, $\underline{P}$ = 1.0). Assumptions could not be met for contingency table X^2 tests for comparisons between respondent attitude and respondent's sex, age, education, and background, or who prepared their stewardship plan.

Respondents believed that the recommendations they received satisfied their desired objectives (88%, $\underline{n}$ = 217) (Figure 54). Respondent attitude did not differ among years, administrative regions, or physiographic regions (K-W X^2 = 2.715, df = 2, $\underline{P}$ = 0.257; K-W X^2 = 4.463, df = 5, $\underline{P}$ = 0.485; K-W X^2 = 0.483, df = 2, $\underline{P}$ = 0.785, respectively). Respondent attitude was related to who prepared the respondent's stewardship plan (X^2 = 9.075, df = 3, $\underline{P}$ = 0.028). Respondents whose plan was prepared by private consulting foresters believed the recommendations that they received did not satisfy their desired objectives significantly more often than expected (cell X^2 = 9.63, df = 1, $\underline{P}$<0.05). Respondent attitude was not related to the amount of land owned in Virginia enrolled in the FSP (M-W $\underline{Z}$ = -1.505, $\underline{P}$ = 0.132), and length of ownership of the stewardship property (M-W $\underline{Z}$ = -0.417, $\underline{P}$ = 0.677). I could not detect the existence of any other relationships due to insufficient sample sizes in cell X^2.

Plan Preparation

In Virginia, VDOF staff prepared most stewardship plans (91.6%, $\underline{n}$ = 215). Private forest consultants and industrial foresters prepared very few plans (6%, 0.5%, respectively). Some respondents could not recall or did not know who prepared their stewardship plan (1.9%). No significant differences were detected in plan preparer

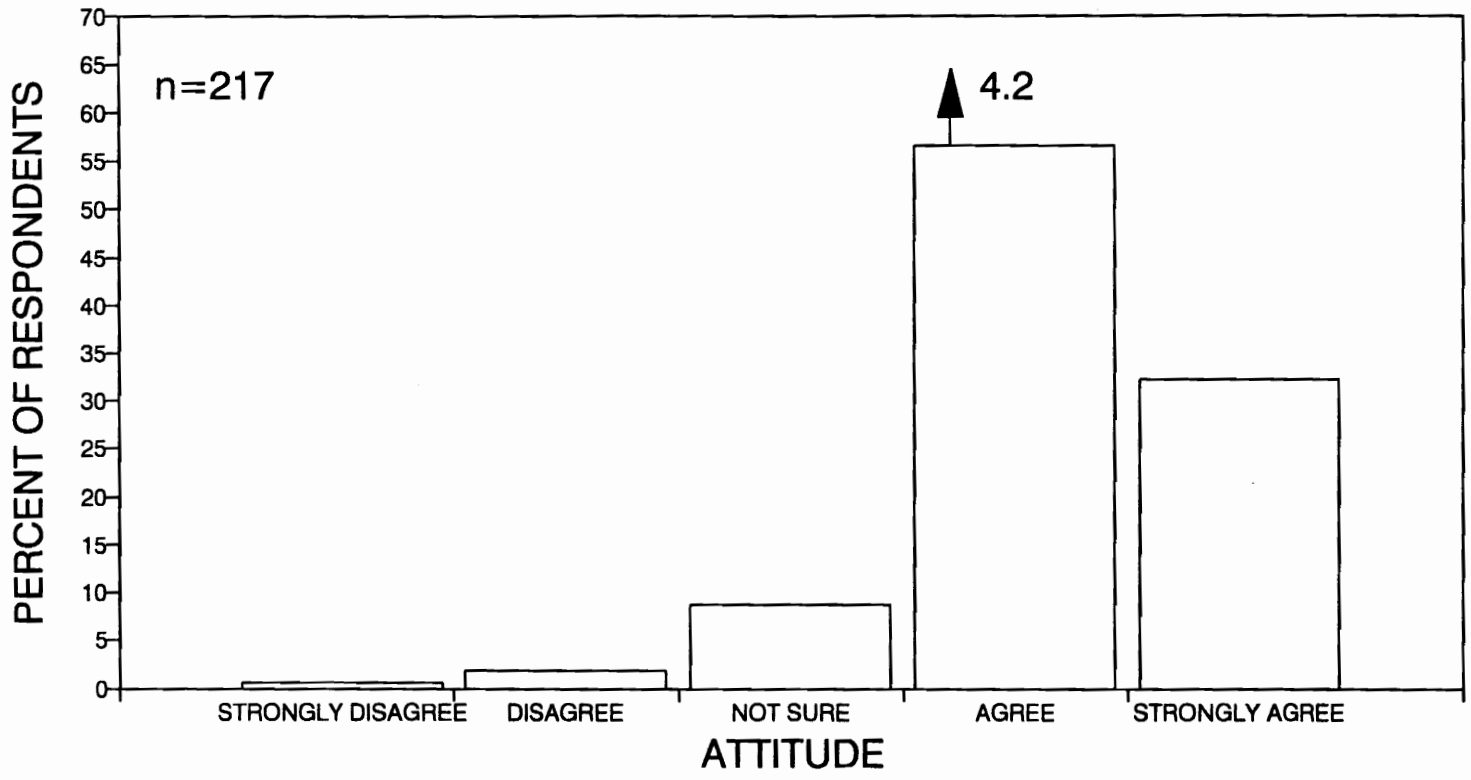

Figure 54. Expressed attitude of VA FSP participants from 1991 through 1993 to the statement, "The recommendations satisfied my desired objectives" (arrow represents mean respondent attitude based on numeric conversion where strongly disagree = 1, disagree = 2, not sure = 3, agree = 4, and strongly agree = 5).

among years, administrative regions, or physiographic regions (K-W X^2 = 4.044, df = 2, $\underline{P}$ = 0.132; K-W X^2 = 6.774, df = 5, $\underline{P}$ = 0.238; K-W X^2 = 3.561, df = 2, $\underline{P}$ = 0.169, respectively).

When asked to identify whom they believed had provided the specific wildlife recommendations contained in their stewardship plans, 82.3% ($\underline{n}$ = 215) of respondents provided an opinion. According to respondents, wildlife information and recommendations were provided by 1 or more natural resource professionals. Respondents believed that VDOF personnel provided wildlife resource information and recommendations in most stewardship plans (81.1%, $\underline{n}$ = 148), whereas VDGIF, private wildlife consultants, and NHP provided information and recommendations in 55.4%, 7.4%, and 1.4% of plans respectively.

According to respondents ($\underline{n}$ = 210), the frequency with which required natural resource information had been included in their stewardship plans was as follows: historical and cultural--12.9%; non-timber plants--51.4%; recreation and esthetics--68.6%; soils--68.6%; T&E species--24.3%; timber--93.8%; water and wetlands--68.6%; wildlife and fisheries--89.5%. Non-timber plant information was included more frequently in stewardship plans received by respondents who entered the FSP in 1992 than those in 1991 and, significantly so, those in 1993 (K-W X^2 = 7.588, df = 2, $\underline{P}$ = 0.023). T&E species information was included more frequently in stewardship plans received by respondents who entered the FSP in 1992 than those in 1991 and, significantly so, those in 1993 (K-W X^2 = 8.204, df = 2, $\underline{P}$ = 0.017). Frequency of appearance of timber resource information appeared to differ among years (K-W X^2 = 10.222, df = 2, $\underline{P}$ = 0.006), but multiple comparison tests did not reveal such a difference. The frequency of appearance of all other resources did not differ among years (historical and cultural-- K-W X^2 = 4.281, df = 2, $\underline{P}$ = 0.118; recreation and esthetics-- K-W X^2 = 0.084, df = 2, $\underline{P}$ = 0.959; soils-- K-W X^2 = 3.166, df = 2, $\underline{P}$ = 0.205; water and wetlands-- K-W X^2 = 4.553, df = 2, $\underline{P}$ = 0.103; wildlife and fisheries-- K-W X^2 = 3.959, df = 2, $\underline{P}$ = 0.138). The frequency of appearance did

not differ among administrative regions or physiographic regions for any resource (historical and cultural-- K-W X^2 = 2.609, df = 5, P = 0.760; K-W X^2 = 0.634, df = 2, P = 0.728; non-timber plants-- K-W X^2 = 5.426, df = 5, P = 0.366; K-W X^2 = 3.760, df = 2, P = 0.156; recreation and esthetics-- K-W X^2 = 1.921, df = 5, P = 0.860; K-W X^2 = 0.058, df = 2, P = 0.972; soils-- K-W X^2 = 1.636, df = 5, P = 0.897; K-W X^2 = 0.227, df = 2, P = 0.893; T&E species-- K-W X^2 = 2.871, df = 5, P = 0.720; K-W X^2 = 1.440, df = 2, P = 0.487; timber-- K-W X^2 = 9.169, df = 5, P = 0.103; K-W X^2 = 1.903, df = 2, P = 0.386; water and wetlands-- K-W X^2 = 1.327, df = 5, P = 0.932; K-W X^2 = 0.470, df = 2, P = 0.791; wildlife and fisheries-- K-W X^2 = 3.154, df = 5, P = 0.676; K-W X^2 = 2.293, df = 2, P = 0.318). I was unable to determine whether the frequency of appearance was related to who had prepared the stewardship plan due to insufficient cell sample sizes in X^2 tables.

Stewardship Plan Wildlife Recommendations

Respondents were asked to identify from a list of common wildlife management techniques those that appeared as recommendations in their stewardship plans, those on which they had initiated work, and those they had completed (Table 9). Overall, development of food plots had been recommended most frequently (90%, n = 170). Provision of a water source and creation and/or management of snags were recommended least often (32.7%, n = 165, 26%, n = 150, respectively). Initiation of work on wildlife recommendations that appeared in stewardship plans was highest for creating edge (68.6%, n = 118), establishing mast producing species (65.4%, n = 54), and constructing brush piles (65.6%, n = 96). Initiation of work on wildlife recommendations that appeared in stewardship plans was lowest for prescribed burning (37%, n = 73) and clearcut as part of timber management (40.5%, n = 79). Completion of work on wildlife recommendations that appeared in stewardship plans was greatest for provision of a water source (76.9%, n = 26) and prescribed burning (66.7%, n = 27); clearcut for wildlife purposes only (37%, n = 27), "daylighting" of

Table 9. Frequencies, reported by VA FSP participants from 1991 through 1993, with which common wildlife management techniques appeared as recommendations in their stewardship plans, work had been initiated on those recommendations, and work had been completed on those recommendations (expressed as number of respondents).

	Appeared as a recommendation			Initiated work			Completed Work		
Wildlife management technique	Yes	No	n	Yes	No	Missing	Yes	No	Missing
Construction of nest boxes/platforms	61	101	162	30	15	16	15	9	6
Construction of brush piles	96	72	168	63	2	31	29	18	16
Planting of hedgerows/windbreaks	74	93	167	38	18	18	16	8	14
Creation and/or management of snags	39	111	150	24	5	10	10	9	5
Creation or placement of dead or downed wood	61	96	157	36	11	14	19	9	8
Creation of edge	118	42	160	81	8	29	37	22	22
"Daylighting" roads	92	67	159	55	13	24	22	18	15
Development of food plots	153	17	170	96	21	36	41	24	31
Prescribed burning	73	99	172	27	30	16	18	4	5
Clearcut as part of a timber management plan	79	97	176	32	24	23	19	6	7
Clearcut for wildlife purposes only	64	105	169	27	21	16	10	7	10
Creation of forest openings associated with a timber management plan	84	84	168	46	20	18	21	10	15
Creation of forest openings for wildlife only	107	58	165	62	21	24	30	12	20
Establishment of warm or cool season grass cover	104	62	166	55	22	27	26	12	17
Establishment of mast producing species (hard or soft)	81	84	165	53	11	17	30	13	10
Provision of a water source	54	111	165	26	13	15	20	0	6

roads (40%, $\underline{n}$ = 55), and creation and/or management of snags (41.7%, $\underline{n}$ = 24) were lowest.

The frequency of appearance of wildlife recommendations will depend on the landowner's objectives and the site-specific characteristics of their property, however recommendations also were dependent upon other factors. The frequency of appearance of some wildlife enhancement recommendations was related to who had prepared the stewardship plan and who had provided the wildlife recommendations for the plan. "Daylighting" of roads appeared to be related to plan preparer (X^2 = 4.132, df = 1, $\underline{P}$ = 0.042). Although no significant cell X^2s were detected, private consulting foresters recommended "daylighting" more often than VDOF personnel. Establishment of mast producing species also appeared to be related to who had prepared the stewardship plan (X^2 = 7.138, df = 1, $\underline{P}$ = 0.008). Again, no significant cell X^2s were detected, yet private consulting foresters recommended establishment of mast producing species more often than did VDOF personnel. No significant differences were detected among plan preparers for the frequency of use of the following wildlife recommendations: construction of brush piles (X^2 = 2.791, df = 1, $\underline{P}$ = 0.095), planting of hedgerows/windbreaks (X^2 = 0.191, df = 1, $\underline{P}$ = 0.662), creation or placement of dead or downed wood (X^2 = 1.506, df = 1, $\underline{P}$ = 0.220), prescribed burning (X^2 = 0.810, df = 1, $\underline{P}$ = 0.368), clearcutting as part of timber management (X^2 = 0.436, df = 1, $\underline{P}$ = 0.509), and creation of forest openings associated with timber management (X^2 = 3.392, df = 1, $\underline{P}$ = 0.066). Insufficient sample size in X^2 test cells precluded examination for additional relationships between plan preparer and recommendation frequency or type. Recommendation for construction of nest boxes/platforms was related to who had provided wildlife recommendations (X^2 = 8.242, df = 3, $\underline{P}$ = 0.041). No significant cell X^2s values were detected, but VDOF personnel recommended nest box/platform construction less often than did VDGIF biologists. Recommendation for construction of brush piles also was related to who had provided wildlife recommendations (X^2 = 9.796, df = 2, $\underline{P}$ = 0.007). Although

no significant cell X^2s were detected, VDGIF biologists recommended construction of brush piles more often than did VDOF foresters or private wildlife consultants. Additionally, recommendation of food plot development was related to who provided wildlife recommendations (X^2 = 8.980, df = 2, $\underline{P}$ = 0.011). The frequency of plans with wildlife recommendations provided by private wildlife consultants that did not include food plot development as a recommendation was greater than expected (cell X^2 = 7.56, df = 1, $\underline{P}<0.05$). I did not detect the existence of any relationships among who had provided wildlife recommendations and any of the following types of wildlife recommendations: snag creation and/or management (X^2 = 3.500, df = 2, $\underline{P}$ = 0.174), creation of edge (X^2 = 4.348, df = 2, $\underline{P}$ = 0.114), prescribed burning (X^2 = 1.106, df = 2, $\underline{P}$ = 0.575), clearcut for wildlife purposes only (X^2 = 0.267, df = 2, $\underline{P}$ = 0.875), creation of forest openings for wildlife only (X^2 = 0.066, df = 2, $\underline{P}$ = 0.068), establishment of mast producing species (X^2 = 1.897, df = 2, $\underline{P}$ = 0.808), and provision of a water source (X^2 = 4.643, df = 2, $\underline{P}$ = 0.098). Insufficient cell sample size precluded further analysis of comparisons between frequency of use of a recommendation and who had provided wildlife recommendations for planting of hedgerows/windbreaks, creation or placement of dead or downed wood, "daylighting" of roads, clearcut as part of timber management, and creation of forest openings associated with timber management.

Impediments to Plan Implementation

Only slightly more respondents agreed (46.1%) with the statement "I don't have enough money available to implement or complete the recommendations" (see Appendix E, question 39) than had disagreed (41.3%) ($\underline{n}$ = 191) (Figure 55). Respondent attitude did not differ among years, administrative regions, or physiographic regions (K-W X^2 = 0.632, df = 2, $\underline{P}$ = 0.729; K-W X^2 = 3.704, df = 5, $\underline{P}$ = 0.593; K-W X^2 = 0.118, df = 2, $\underline{P}$ = 0.943, respectively). Responses to this statement were related to respondent age (X^2 = 7.806, df = 2, $\underline{P}$ = 0.020). No

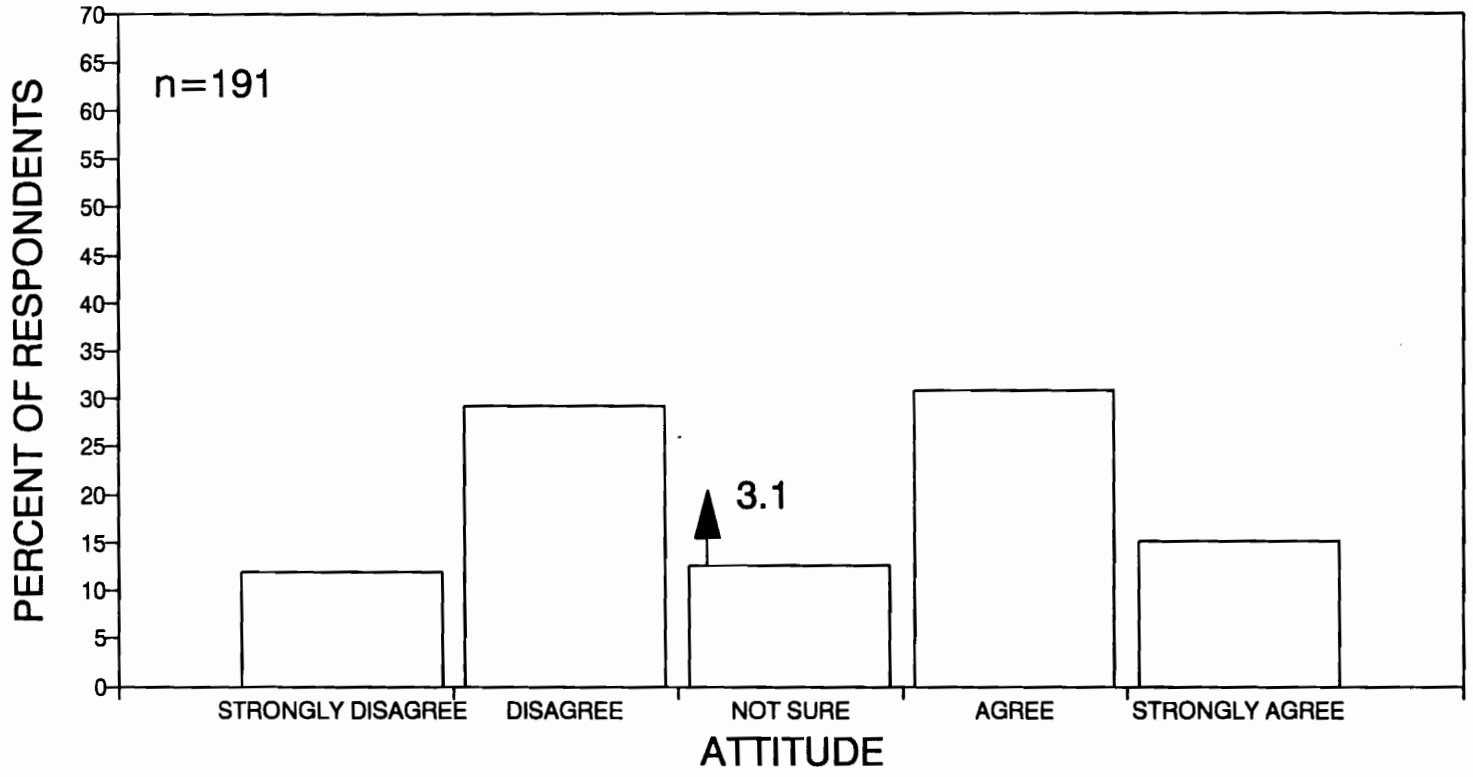

Figure 55. Expressed attitude of VA FSP participants from 1991 through 1993 to the statement, "I don't have enough money available to implement or complete the recommendations" (arrow represents mean respondent attitude based on numeric conversion wher strongly disagree = 1, disagree = 2, not sure = 3, agree = 4, and strongly agree = 5).

significant cell X^2 were detected, yet older respondents tended to disagree with this statement more often than younger respondents. Respondent attitude was not related to the amount of land owned in Virginia enrolled in the FSP (M-W $\underline{Z}$ = -1.479, $\underline{P}$ = 0.139). Respondent attitude also was not related to respondent's sex (X^2 = 0.048, df = 1, $\underline{P}$ = 0.826), education (X^2 = 3.625, df = 2, $\underline{P}$ = 0.163), net household income (X^2 = 4.123, df = 4, $\underline{P}$ = 0.390), or background (X^2 = 2.304, df = 3, $\underline{P}$ = 0.512). Assumptions could not be met for contingency table X^2 tests for comparisons between respondent attitude regarding money versus who prepared the stewardship plan.

Respondents believed it was not difficult to find people who could give them technical advice (79.6%, $\underline{n}$ = 187) (Figure 56). Respondent attitude did not differ among years, administrative regions, or physiographic regions (K-W X^2 = 0.816, df = 2, $\underline{P}$ = 0.665; K-W X^2 = 2.992, df = 5, $\underline{P}$ = 0.701; K-W X^2 = 1.309, df = 2, $\underline{P}$ = 0.520, respectively). No significant differences were detected in respondent attitude for the amount of land owned in Virginia enrolled in the FSP (M-W $\underline{Z}$ = -0.227, $\underline{P}$ = 0.820), percentage of total land holdings owned in Virginia included in the FSP (M-W $\underline{Z}$ = -0.532, $\underline{P}$ = 0.595), length of ownership of the stewardship property (M-W $\underline{Z}$ = -0.830, $\underline{P}$ = 0.407), whether professional advice previously had been received (X^2 = 0.029, df = 1, $\underline{P}$ = 0.864), and respondent's age (X^2 = 2.901, df = 2, $\underline{P}$ = 0.234), education (X^2 = 5.800, df = 2, $\underline{P}$ = 0.055), and background (X^2 = 5.623, df = 3, $\underline{P}$ = 0.131). Assumptions could not be met for contingency table X^2 tests for comparisons between respondent attitude about availability of technical advice and respondent's sex and who prepared the stewardship plan.

Respondents did not believe that the recommendations in their stewardship plans were impractical (84.4%, $\underline{n}$ = 185) (Figure 57). No significant differences were detected among years, administrative regions, or physiographic regions (K-W X^2 = 0.025, df = 2, $\underline{P}$ = 0.988; K-W X^2 = 9.094, df = 5, $\underline{P}$ = 0.105; K-W X^2 = 0.600, df = 2, $\underline{P}$ = 0.741, respectively). Respondent attitude was not related to the amount of land owned in Virginia enrolled in the FSP (M-W $\underline{Z}$ = -1.332, $\underline{P}$ = 0.183), length of

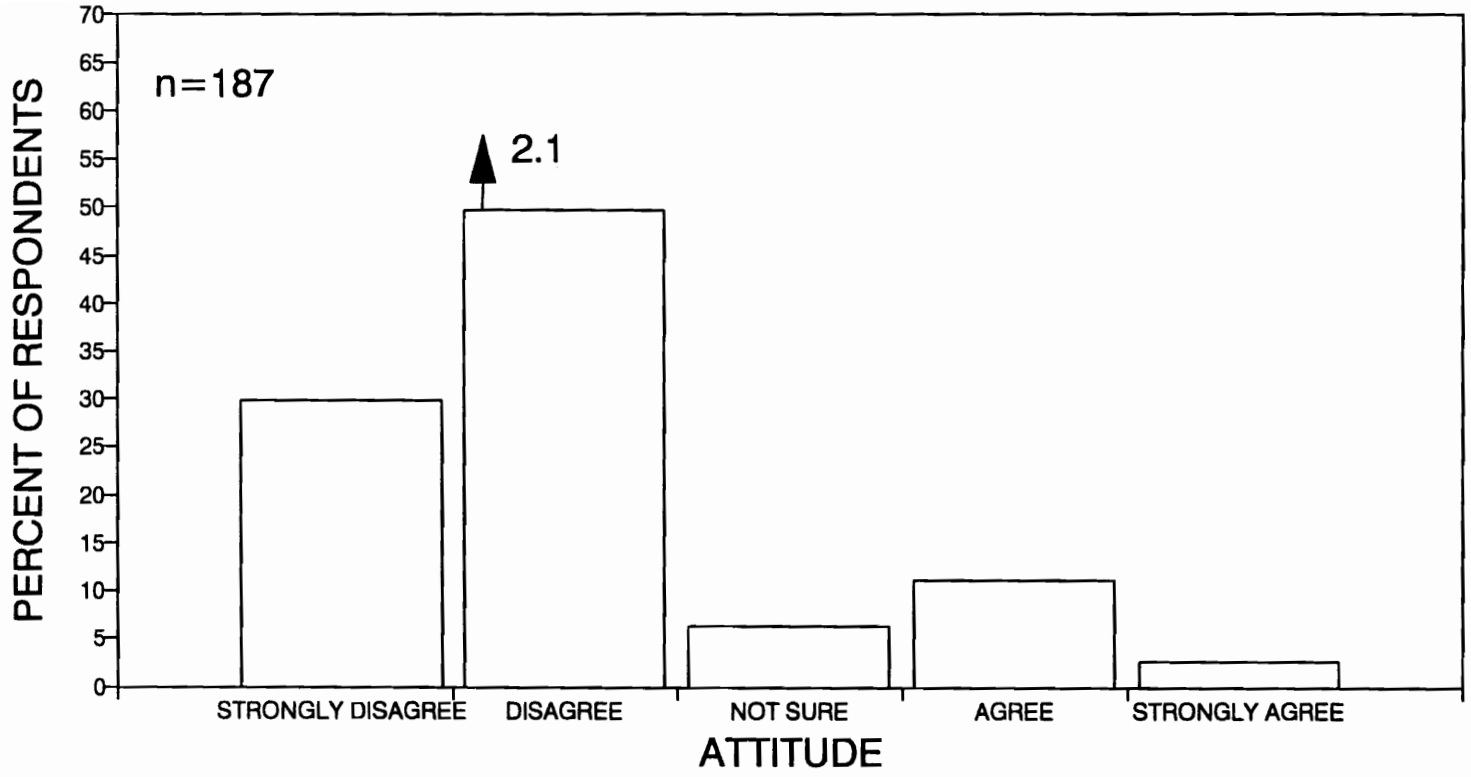

Figure 56. Expressed attitude of VA FSP participants from 1991 through 1993 to the statement, "It is difficult to find people to give me technical advice" (arrow represents mean respondent attitude based on numeric conversion where strongly disagree = 1, disagree = 2, not sure = 3, agree = 4, and strongly agree = 5).

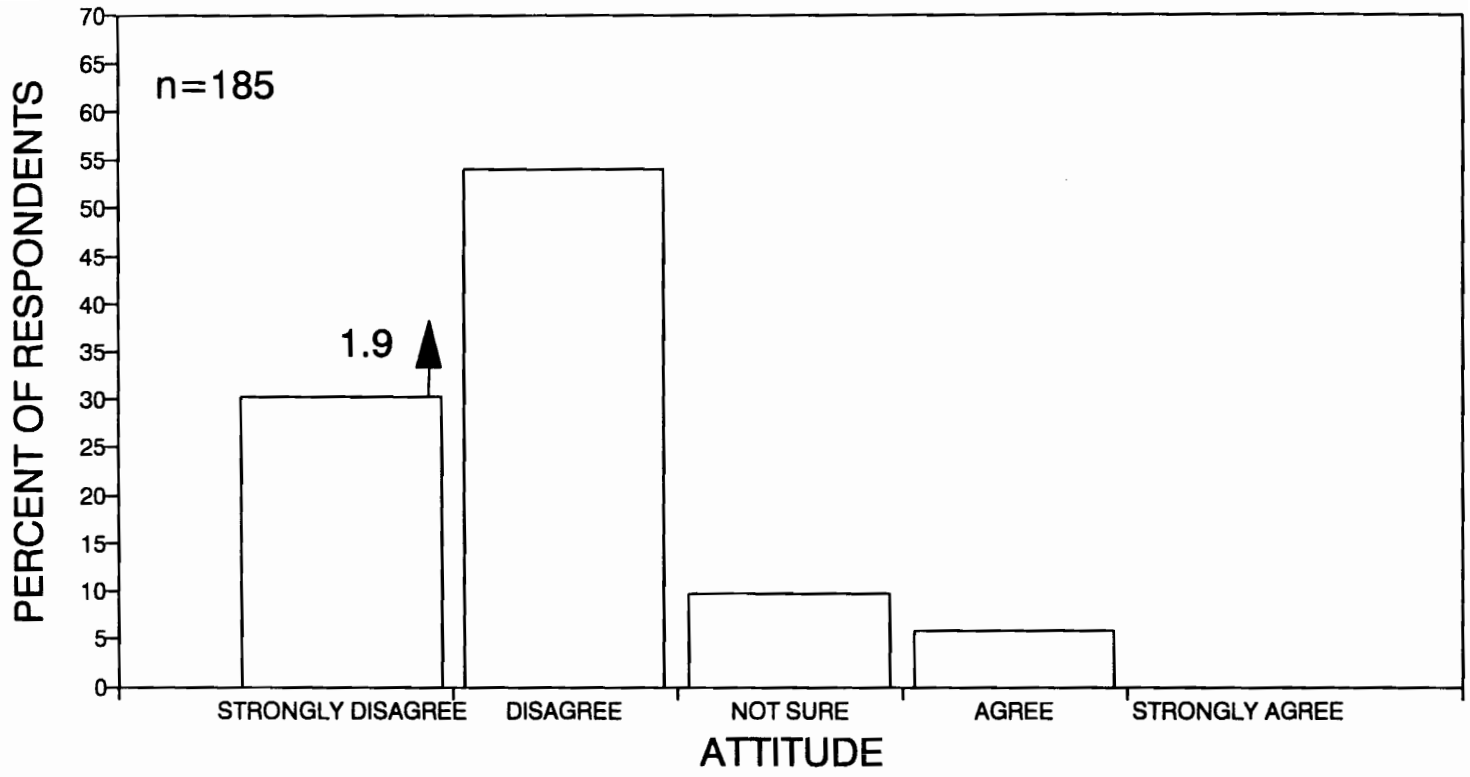

Figure 57. Expressed attitude of VA FSP participants from 1991 through 1993 to the statement, "The recommendations were impractical" (arrow represents mean respondent attitude based on numeric conversion where strongly = 1, disagree = 2, not sure = 3, agree = 4, and strongly agree = 5).

ownership of the stewardship property (M-W $\underline{Z}$ = -1.313, $\underline{P}$ = 0.189), and whether professional advice previously had been received (X^2 = 0.044, df = 1, $\underline{P}$ = 0.834).

When presented with the statement "It is hard to find trained or skilled help" (see Appendix E, question 42), respondents disagreed (55.1%) more often than they agreed with it (33.2%) ($\underline{n}$ = 187) (Figure 58). Respondent attitude did not differ among years, administrative regions, or physiographic regions (K-W X^2 = 2.474, df = 2, $\underline{P}$ = 0.290; K-W X^2 = 3.235, df = 5, $\underline{P}$ = 0.664; K-W X^2 = 1.524, df = 2, $\underline{P}$ = 0.467, respectively), but was related to their background (X^2 = 14.378, df = 3, $\underline{P}$ = 0.002). Respondents with an urban/city background were more likely to agree with this statement (cell X^2 = 7.11, $\underline{P}<0.05$) than to disagree (cell X^2 = 4.27, $\underline{P}<0.05$). Respondent attitude was not related to the amount of land owned in Virginia enrolled in the FSP (M-W $\underline{Z}$ = -1.905, $\underline{P}$ = 0.057), length of ownership of the stewardship property (M-W $\underline{Z}$ = -1.361, $\underline{P}$ = 0.173), whether professional advice previously had been received (X^2 = 2.922, df = 1, $\underline{P}$ = 0.087), nor respondent's sex (X^2 = 1.229, df = 1, $\underline{P}$ = 0.268), age (X^2 = 5.624, df = 2, $\underline{P}$ = 0.060), and education (X^2 = 3.720, df = 2, $\underline{P}$ = 0.156).

Respondents did not believe that advanced age or ill health made it hard for them to work outside (85.2%, $\underline{n}$ = 190) (Figure 59). Again, respondent attitude did not differ among years, administrative regions, or physiographic regions (K-W X^2 = 0.248, df = 2, $\underline{P}$ = 0.883; K-W X^2 = 4.996, df = 5, $\underline{P}$ = 0.416; K-W X^2 = 0.334, df = 2, $\underline{P}$ = 0.846, respectively), but was related to respondent age (X^2 = 21.255, df = 2, $\underline{P}$ = 0.000) and education level (X^2 = 6.277, df = 2, $\underline{P}$ = 0.043), and the type ownership of the stewardship property (X^2 = 17.956, df = 5, $\underline{P}$ = 0.003). Respondents who were $\geq$60 years old believed that age or ill health made it hard for them to work outside more often than expected (cell X^2 = 14.01, df = 1, $\underline{P}<0.05$). No significant cell X^2s were detected for education level, yet respondents with less education believed more than expected that advanced age or ill health made it hard for them to work outside. Respondents with stewardship property in family partnership

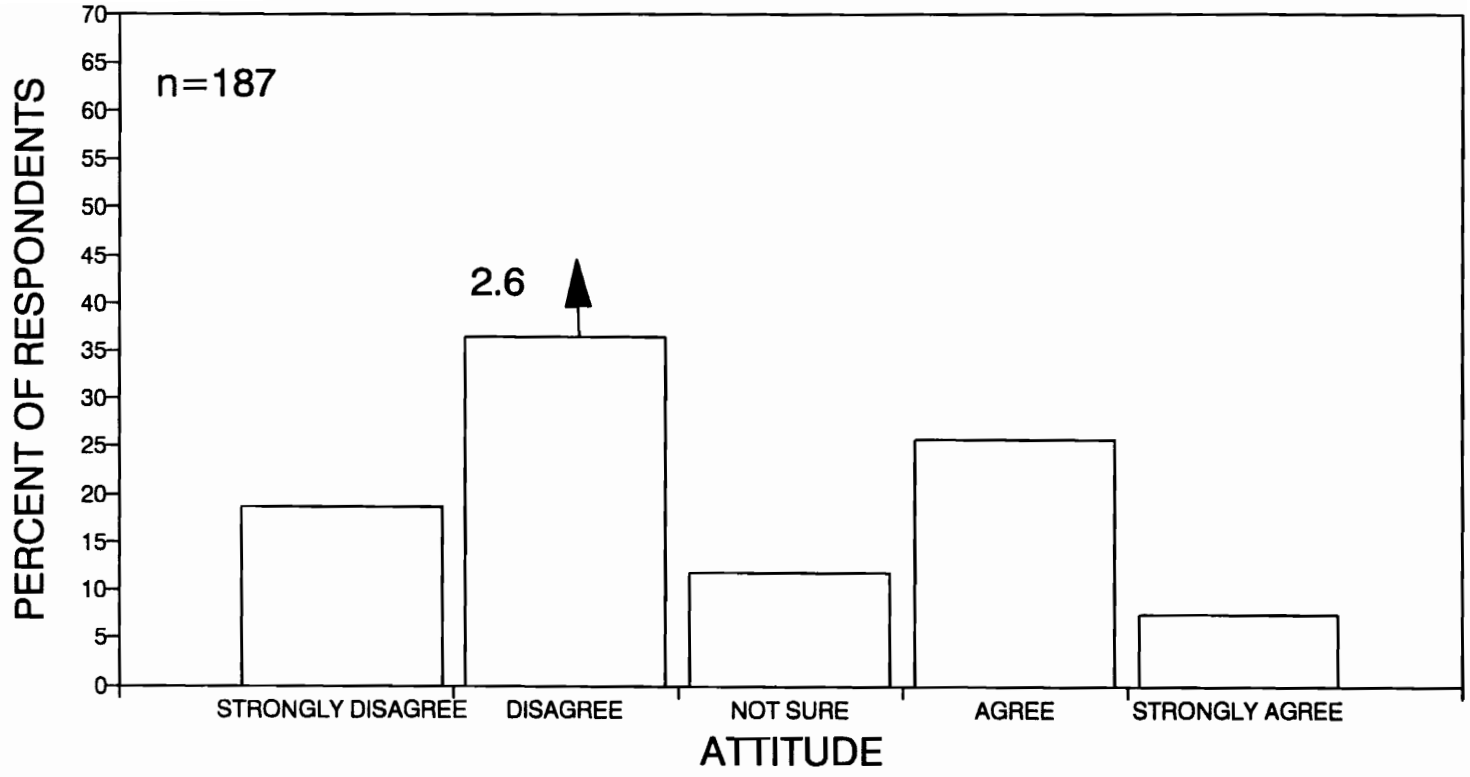

Figure 58. Expressed attitude of VA FSP participants from 1991 through 1993 to the statement, "It is hard to find trained or skilled help" (arrow represents mean respondent attitude based on numeric conversion where strongly disagree = 1, disagree = 2, not sure = 3, agree = 4, and strongly agree = 5).

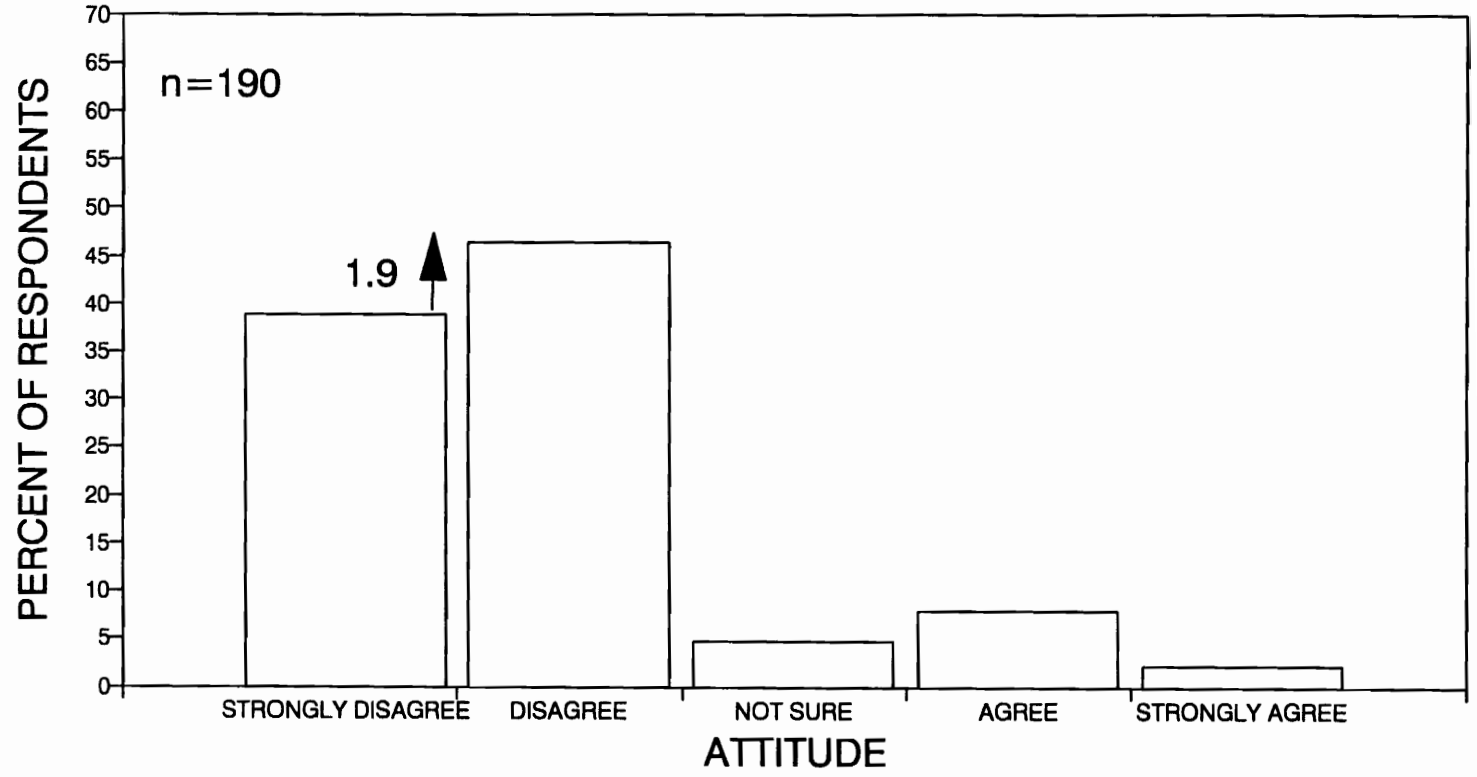

Figure 59. Expressed attitude of VA FSP participants from 1991 through 1993 to the statement, "Due to advanced age or ill health, it is hard for me to work outside" (arrow represents mean respondent attitude based on numeric conversion where strongly disagree = 1, disagree = 2, not sure = 3, agree = 4, and strongly agree = 5).

held a similar belief (cell X^2 = 12.5, df = 1, $\underline{P}$<0.05). Respondent attitude was not related to the length of ownership of the stewardship property (M-W $\underline{Z}$ = -1.035, $\underline{P}$ = 0.301) and visitation rate (X^2 = 3.342, df = 2, $\underline{P}$ = 0.188).

Respondents disagreed (93.6%, $\underline{n}$ = 187) with the statement "The recommendations were too difficult for me to understand" (see Appendix E, question 44) (Figure 60). Respondent attitude did not differ among years, administrative regions, or physiographic regions (K-W X^2 = 0.679, df = 2, $\underline{P}$ = 0.712; K-W X^2 = 9.880, df = 5, $\underline{P}$ = 0.079; K-W X^2 = 2.685, df = 2, $\underline{P}$ = 0.261, respectively) nor was it related to the amount of land owned in Virginia enrolled in the FSP (M-W $\underline{Z}$ = -1.515, $\underline{P}$ = 0.130) and length of ownership of the stewardship property (M-W $\underline{Z}$ = -0.679, $\underline{P}$ = 0.497).

When presented with the statement "I don't have time available to carry out the recommendations" (see Appendix E, question 45), respondents disagreed (48.7%) only slightly more often than they agreed (45.5%) ($\underline{n}$ = 189) (Figure 61). Respondent attitude did not vary among years, administrative regions, or physiographic regions (K-W X^2 = 4.812, df = 2, $\underline{P}$ = 0.090; K-W X^2 = 6.509, df = 5, $\underline{P}$ = 0.260; K-W X^2 = 5.759, df = 2, $\underline{P}$ = 0.056, respectively). Attitude about available time was not related to respondent's sex (X^2 = 0.036, df = 1, $\underline{P}$ = 0.849), age (X^2 = 4.941, df = 2, $\underline{P}$ = 0.085), education (X^2 = 1.637, df = 2, $\underline{P}$ = 0.441), marital status (X^2 = 2.748, df = 1, $\underline{P}$ = 0.097), net household income (X^2 = 2.370, df = 4, $\underline{P}$ = 0.668), or background (X^2 = 4.789, df = 3, $\underline{P}$ = 0.188), nor to the amount of land owned in Virginia enrolled in the FSP (M-W $\underline{Z}$ = -0.269, $\underline{P}$ = 0.788), visitation rate (X^2 = 2.240, df = 2, $\underline{P}$ = 0.326), and whether professional advice previously had been received (X^2 = 0.810, df = 1, $\underline{P}$ = 0.368).

Slightly more respondents believed they lacked the equipment needed to carry out the recommendations they received as believed they did not (46.3%, 43.1%, respectively, $\underline{n}$ = 188) (Figure 62). Respondent attitude was consistent among years, administrative regions, and physiographic regions (K-W X^2 = 2.561, df = 2, $\underline{P}$ =

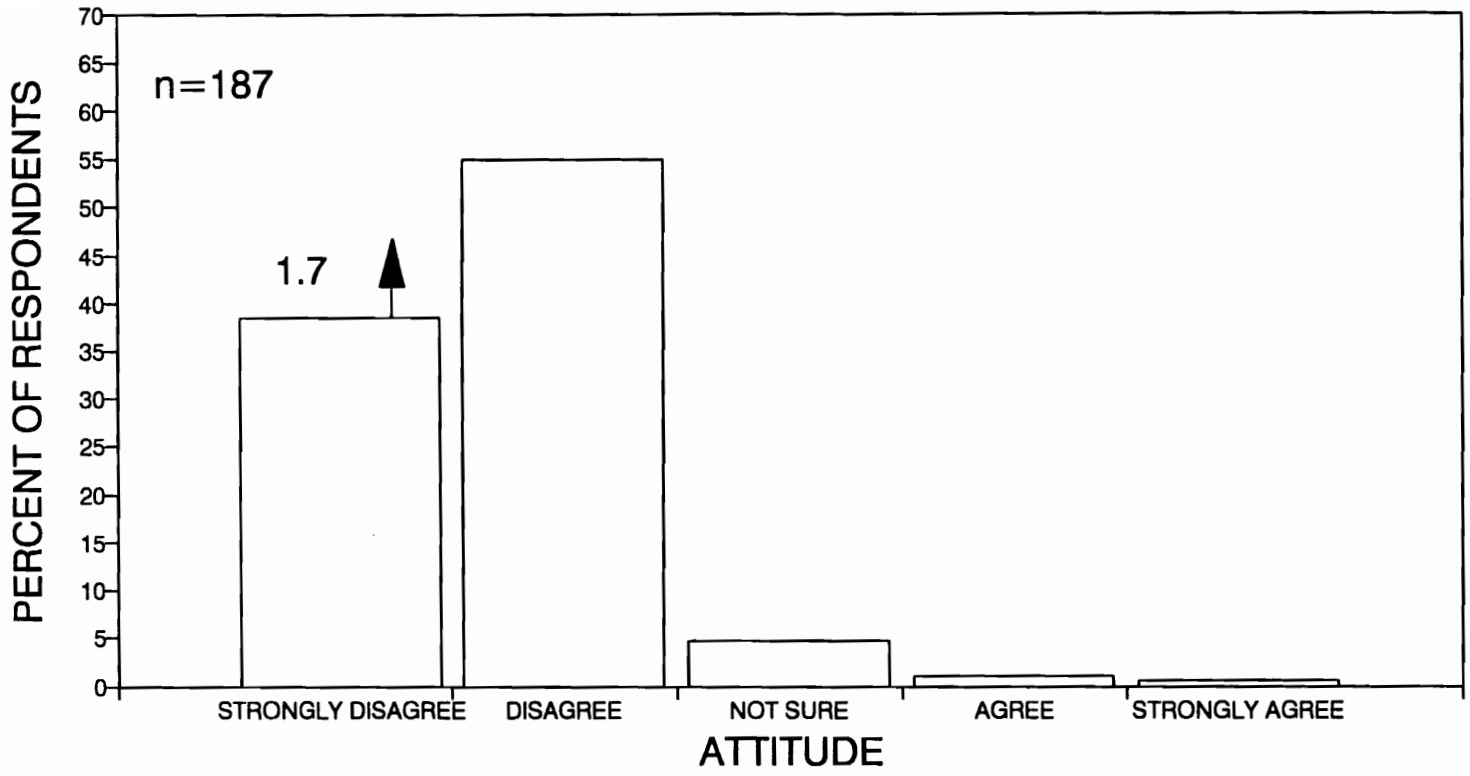

Figure 60. Expressed attitude of VA FSP participants from 1991 through 1993 to the statement, "The recommendations were too difficult for me to understand" (arrow represents mean respondent attitude based on numeric conversion where strongly disagree = 1, disagree = 2, not sure = 3, agree = 4, and strongly agree = 5).

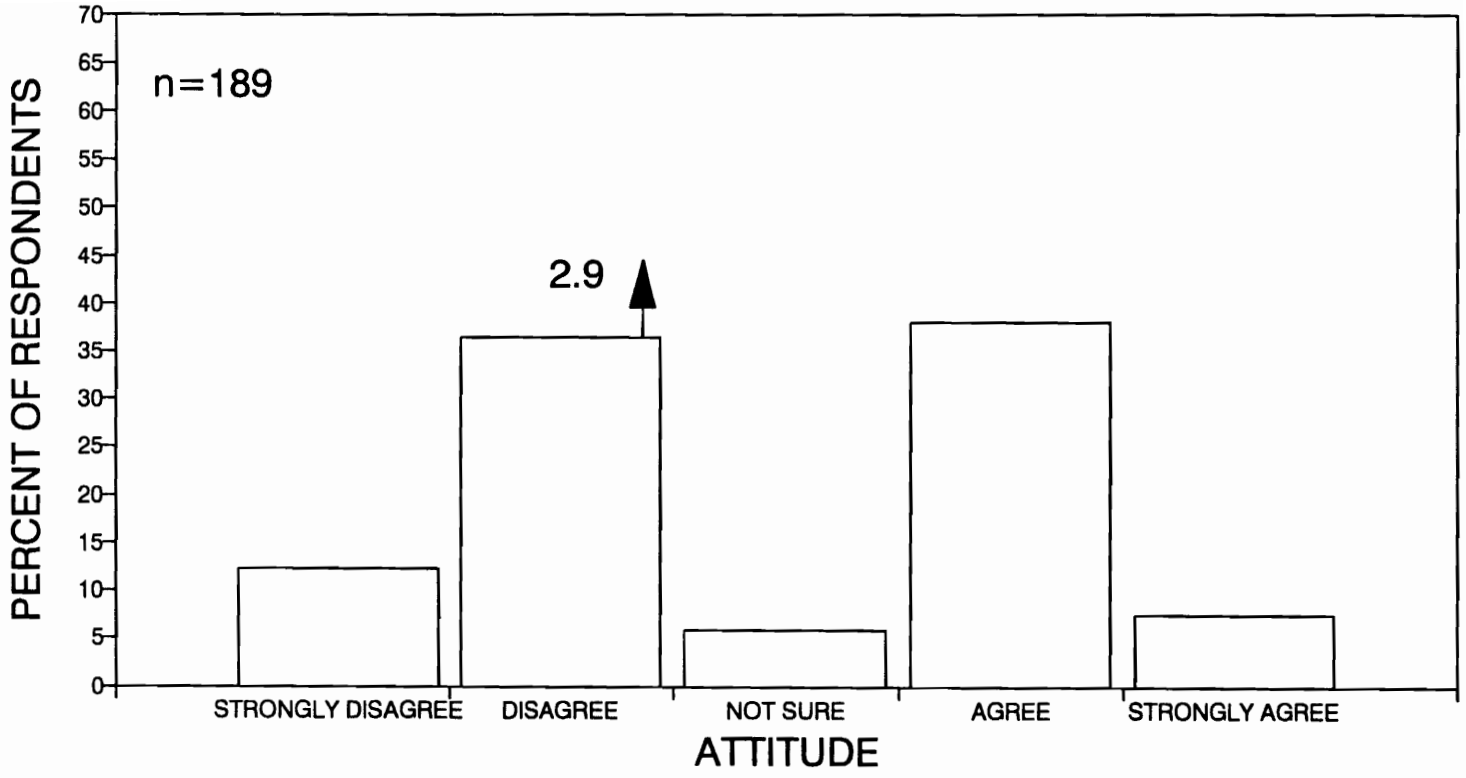

Figure 61. Expressed attitude of VA FSP participants from 1991 through 1993 to the statement, "I don't have time available to carry out the recommendations" (arrow represents mean respondent attitude based on numeric conversion where strongly disagree = 1, disagree = 2, not sure = 3, agree = 4, and strongly agree = 5).

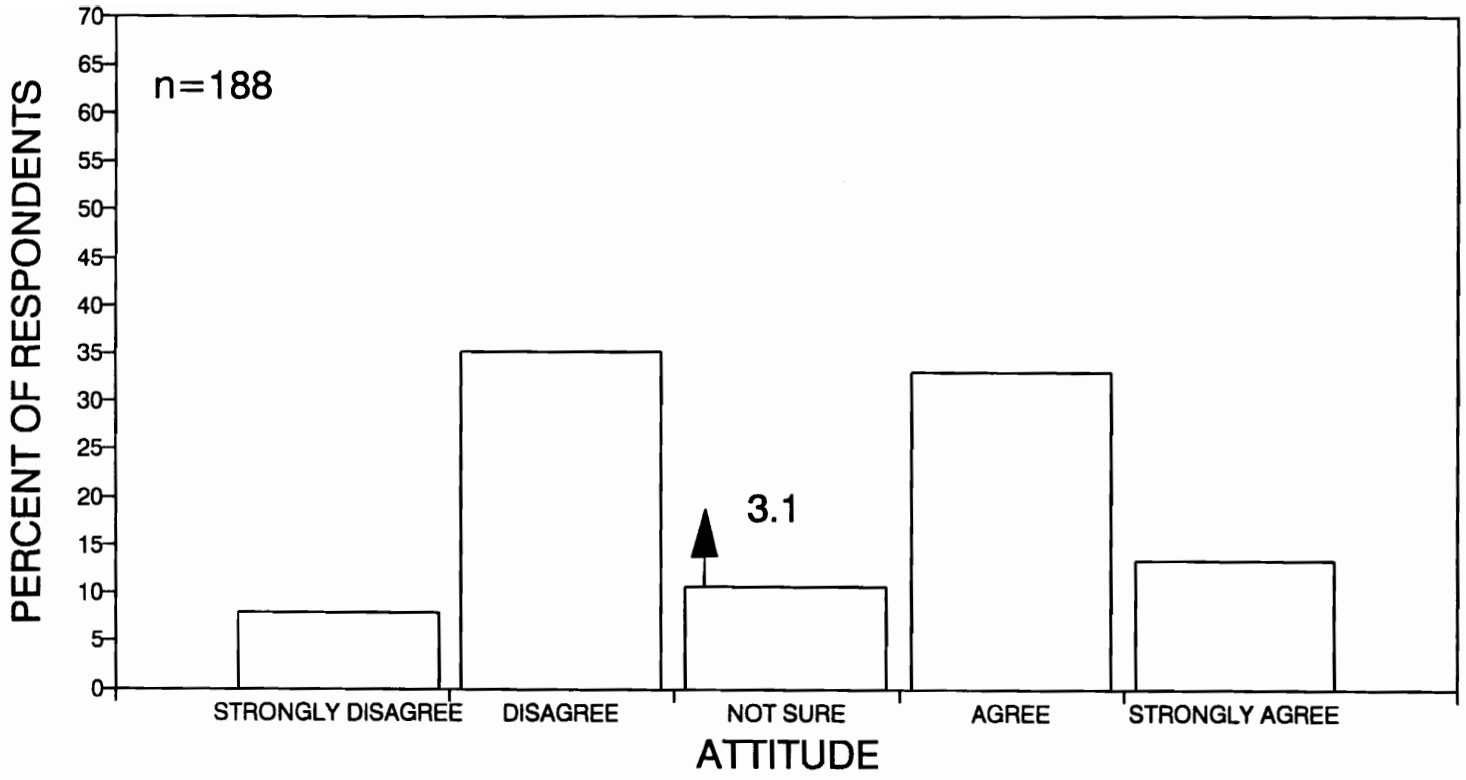

Figure 62. Expressed attitude of VA FSP participants from 1991 through 1993 to the statement, "I don't have the equipment needed to carry out the recommendations" (arrow represents mean respondent attitude based on numeric conversion where strongly disagree = 1, disagree = 2, not sure = 3, agree =4, and strongly agree = 5).

0.278; K-W X^2 = 1.656, df = 5, $\underline{P}$ = 0.894; K-W X^2 = 0.036, df = 2, $\underline{P}$ = 0.982, respectively). Attitude about available equipment was related to respondent's sex (X^2 = 4.653, df = 1, $\underline{P}$ = 0.031), whether the stewardship property was the main residence (X^2 = 5.422, df = 1, $\underline{P}$ = 0.020), and distance from main residence to stewardship property (X^2 = 8.239, df = 2, $\underline{P}$ = 0.016). Although no significant cell X^2s were detected for respondent attitude vs. sex of respondent, females believed they lacked the equipment needed to carry out recommendations more often than expected. There were also no significant cell X^2s were detected for respondent attitude vs. whether the stewardship property was the main residence and distance from main residence to stewardship property. However, respondents who did not reside on their stewardship property believed they lacked the needed equipment more often, whereas those who resided on their stewardship property did not believe equipment needs were troublesome. Respondents who lived 80.5 - 402.3 km from their stewardship properties generally believed they did not have the equipment needed to implement recommendations, whereas those who lived >402.3 km from their stewardship properties believed they did. Respondent attitude about equipment needs was not related to respondent's age (X^2 = 4.262, df = 2, $\underline{P}$ = 0.119), education (X^2 = 1.330, df = 2, $\underline{P}$ = 0.514), net household income (X^2 = 1.959, df = 4, $\underline{P}$ = 0.743), or background (X^2 = 2.103, df = 3, $\underline{P}$ = 0.551), or to the amount of land owned in Virginia enrolled in the FSP (M-W $\underline{Z}$ = -1.206, $\underline{P}$ = 0.228), percentage of total land holdings owned in Virginia included in the FSP (M-W $\underline{Z}$ = -1.189, $\underline{P}$ = 0.234), length of ownership of the stewardship property (M-W $\underline{Z}$ = -1.460, $\underline{P}$ = 0.144), visitation rate (X^2 = 4.248, df = 2, $\underline{P}$ = 0.120), and whether professional advice previously had been received (X^2 = 0.637, df = 2, $\underline{P}$ = 0.745).

Twenty-one percent of respondents ($\underline{n}$ = 111) believed that they had none of the identified impediments (see Appendix G). The majority of respondents without impediments were male (91%), ≥40 years old (91%), and married (100%), and had at least an associate degree (78%), and a net household income of $25,000 - 99,000

(74%). Of respondents who owned <81 ha (n = 80), approximately 15% believed they lacked the time, money, and equipment needed to implement recommendations whereas 10% believed they lacked only time and money. An additional 10% believed they lacked equipment only. The demographic profile of respondents who lacked time, money, and equipment was not different from that of the average FSP participant (see page 81). Those who lacked time and money generally were younger (20 - 59 years old) than other respondents and only half of them were married. Those who lacked only equipment were less educated (≤high school), but had higher net household incomes ($100,000 - 150,000) than other respondents. Of respondents who owned ≥81 ha (n = 31), only 10% believed they lacked the time and money needed to implement the recommendations they received. Overall, a greater percentage of respondents who owned ≥81 ha believed they faced none of the identified impediments than those who owned <81 ha.

Certification of Stewardship Properties

Approximately 60% of respondents (n = 212) were aware of the opportunity to become certified as forest stewards. When asked to respond to the statement "The intent of the forest stewardship certification program is clear to me" (see Appendix E, question 48), most respondents agreed with it (69.8%) (n = 215) (Figure 63). Responses to this statement showed a pattern of relatedness to age of respondent (X^2 = 6.756, df = 2, P = 0.034), but no particular age was dominant. In general, younger respondents disagreed whereas older respondents agreed. Respondent attitude was not related to respondent's education level (X^2 = 3.079, df = 2, P = 0.215).

Only 37.8% of respondents (n = 209) had pursued forest stewardship certification through Virginia's FSP. Pursuit of certification was not related to respondent's sex (X^2 = 1.964, df = 1, P = 0.161), age (X^2 = 3.752, df = 2, P = 0.155), education (X^2 = 0.518, df = 2, P = 0.772), or background (X^2 = 3.939, df = 3, P = 0.268), nor to the total area owned in Virginia (M-W Z = -0.171, P =

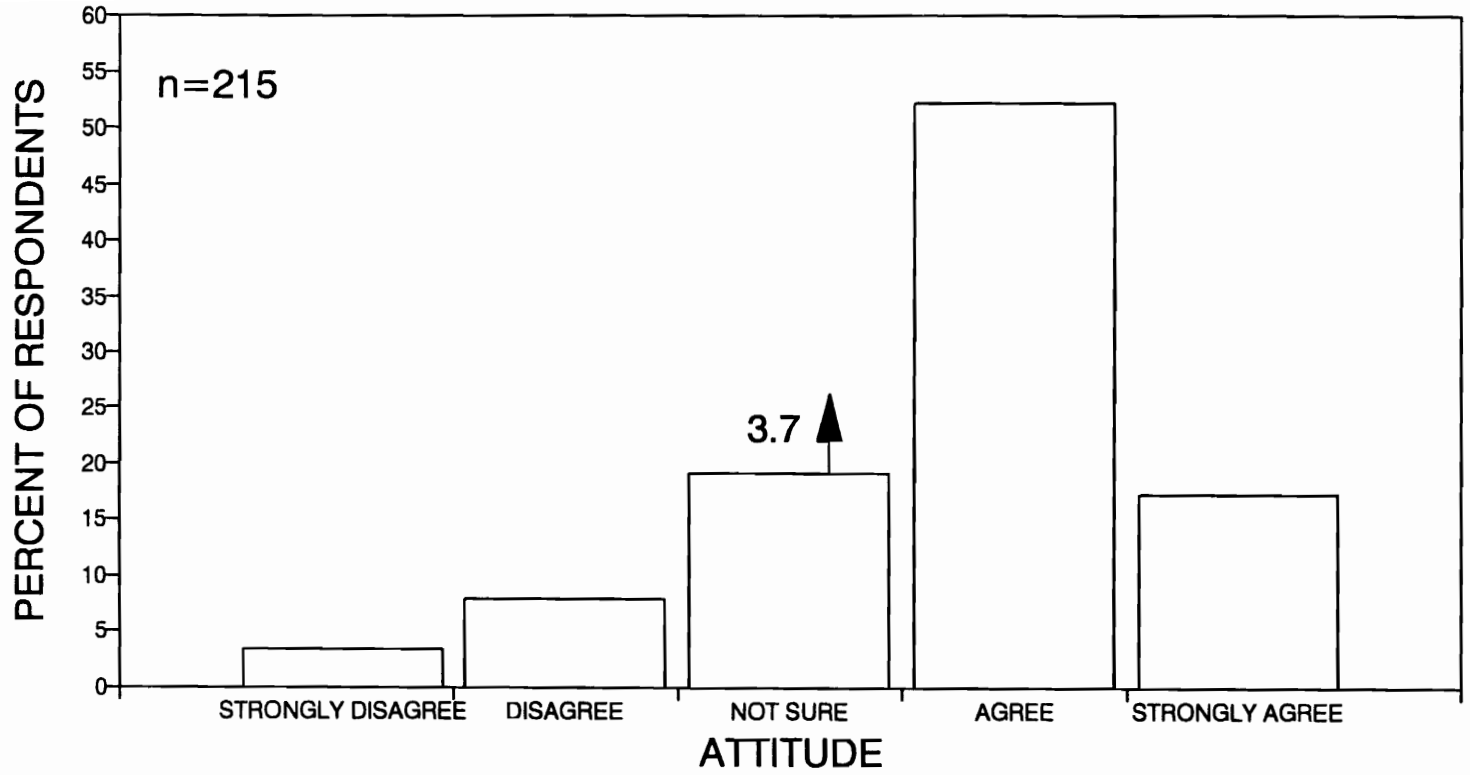

Figure 63. Expressed attitude of VA FSP participants from 1991 through 1993 to the statement, "The intent of the forest stewardship certification program is clear to me" (arrow represents mean respondent attitude based on numeric conversion where strongly disagree = 1, disagree = 2, not sure = 3, agree = 4, and strongly agree = 5).

0.864), the amount of land owned in Virginia enrolled in the FSP (M-W $\underline{Z}$ = -0.815, $\underline{P}$ = 0.249), percentage of total land holdings owned in Virginia included in the FSP (M-W $\underline{Z}$ = -1.153, $\underline{P}$ = 0.249), length of ownership of the stewardship property (M-W $\underline{Z}$ = -1.683, $\underline{P}$ = 0.092), and visitation rate (X^2 = 1.671, df = 2, $\underline{P}$ = 0.434). Four respondents had pursued forest stewardship certification although its intent was not clear to them.

Respondents agreed (80.5%, $\underline{n}$ = 76) (Figure 64) with the statement "My certification serves as a good example to other landowners" (see Appendix E, question 50), but disagreed (66.6%, $\underline{n}$ = 69) with the statement "I wanted certification only for self-gratification" (see Appendix E, question 51) (Figure 65). Respondent attitude about self gratification was not related to respondent's age (X^2 = 3.586, df = 2, $\underline{P}$ = 0.166) or education level (X^2 = 0.387, df = 2, $\underline{P}$ = 0.824). Most respondents (92.5%, $\underline{n}$ = 67) did not want to impress people by becoming certified stewards through the Virginia FSP (Figure 66). However, they did believe that certification motivated them to implement the recommendations in their plans (86.1%, $\underline{n}$ = 72) (Figure 67).

Follow-up Communication

Most respondents (76.2%, $\underline{n}$ = 206) have had communication with VDOF about forest stewardship since they received their stewardship plan and, most frequently, this was with their Area Forester (91.7%, $\underline{n}$ = 133). Communication with the FSP Coordinator was much less frequent (9.3%). Occurrence of follow-up communication and with whom that occurred did not differ among years, administrative regions, or physiographic regions (K-W X^2 = 4.862, df = 2, $\underline{P}$ = 0.088; K-W X^2 = 6.855, df = 5, $\underline{P}$ = 0.232; K-W X^2 = 0.451, df = 2, $\underline{P}$ = 0.798); (K-W X^2 = 0.441, df = 2, $\underline{P}$ = 0.802; K-W X^2 = 1.626, df = 5, $\underline{P}$ = 0.898; K-W X^2 = 1.381, df = 2, $\underline{P}$ = 0.501, respectively).

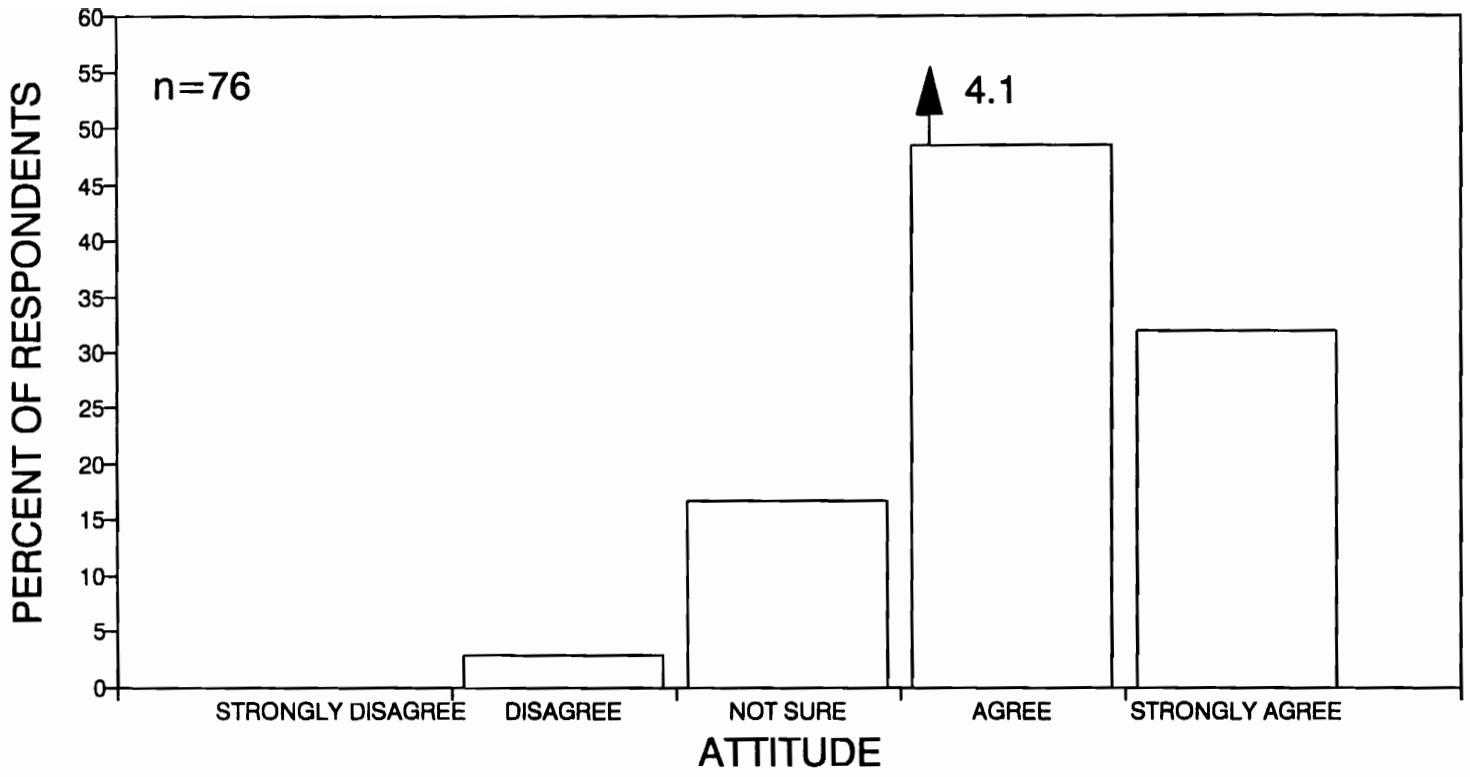

Figure 64. Expressed attitudes of VA FSP participants from 1991 through 1993 to the statement, "My certification serves as a good example to other landowners" (arrow represents mean respondent attitude based on numeric conversion where strongly disagree = 1, disagree = 2, not sure = 3, agree = 4, and strongly = 5).

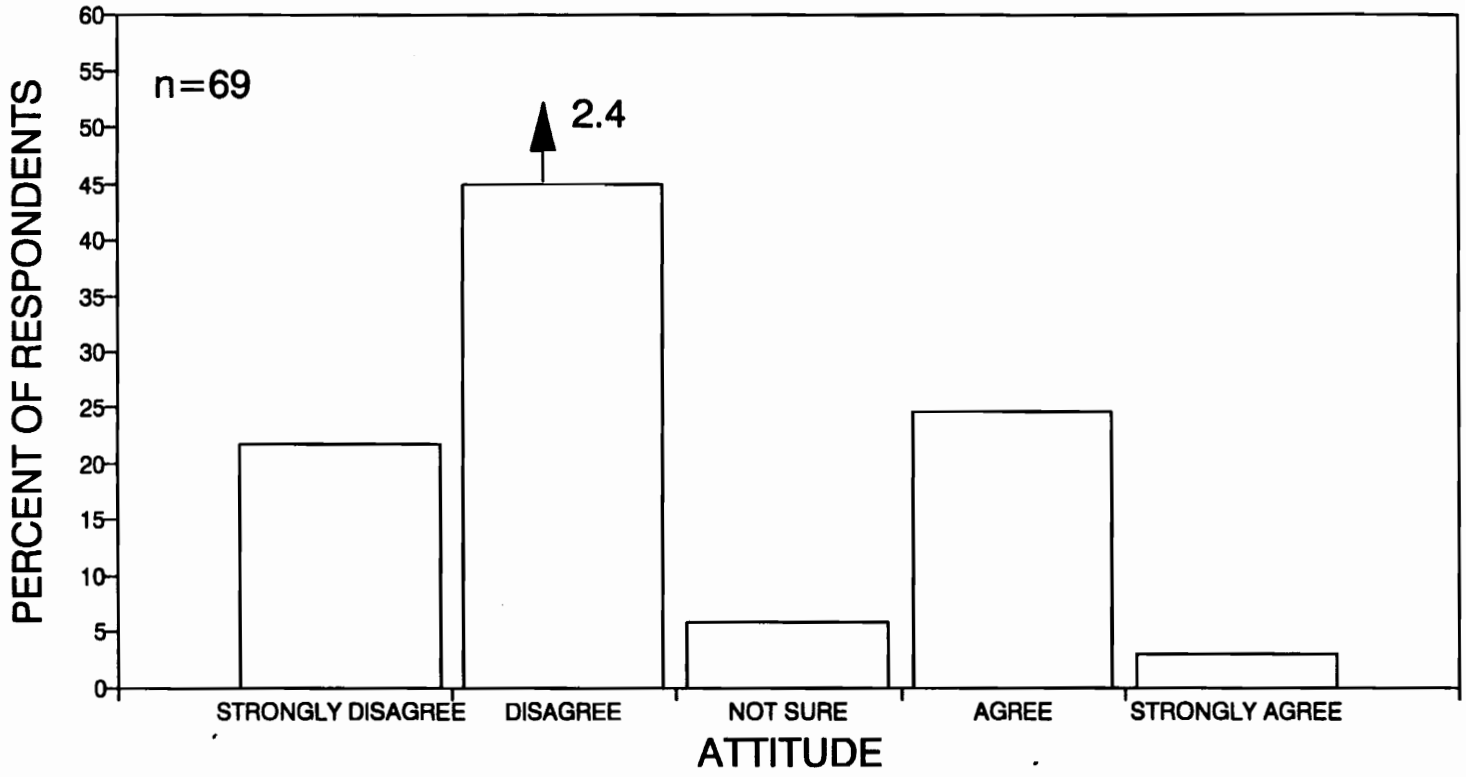

Figure 65. Expressed attitude of VA FSP participants from 1991 through 1992 to the statement, "I wanted certification only for self-gratification" (arrow represents mean respondent attitude based on numeric conversion where strongly disagree = 1, disagree = 2, not sure = 3, agree = 4, and strongly agree = 5).

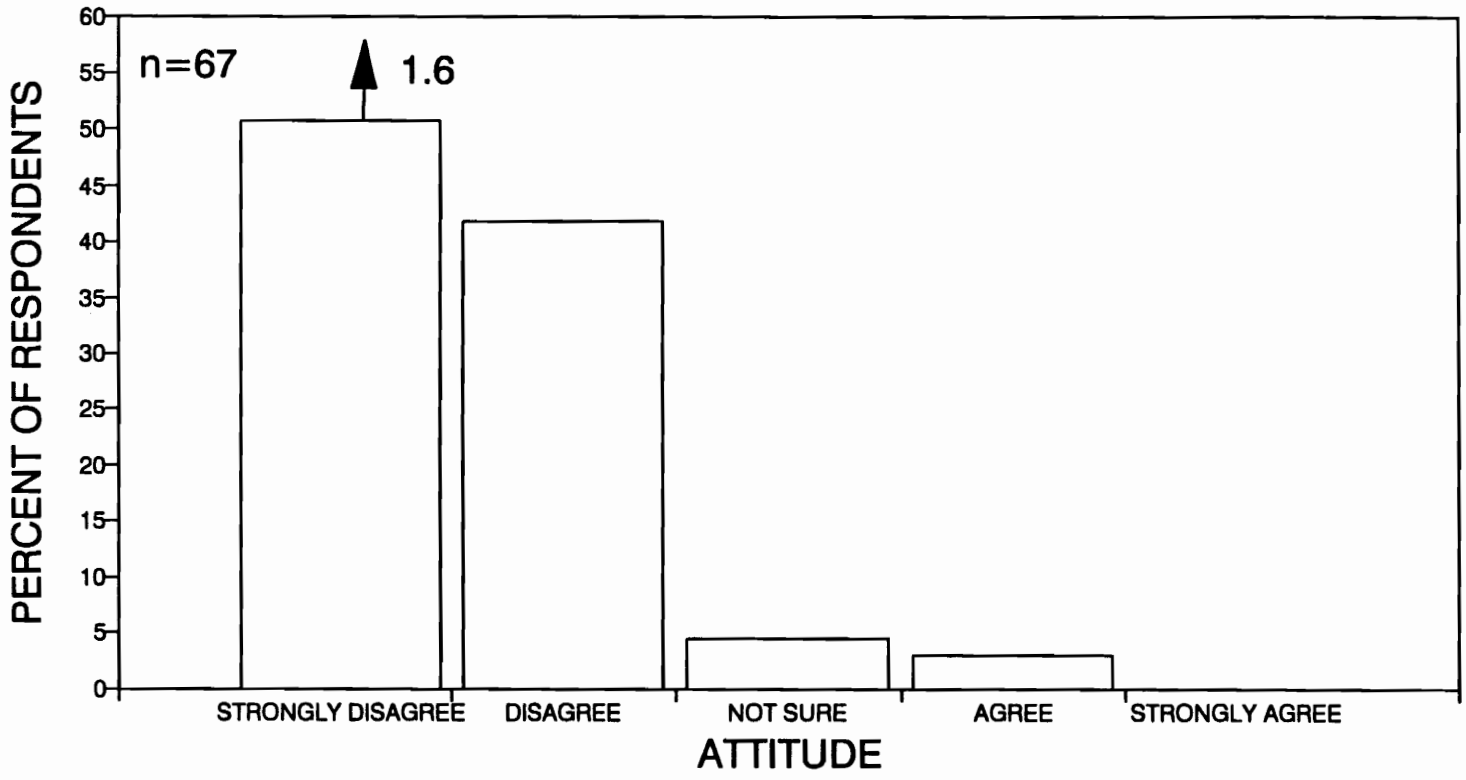

Figure 66. Expressed attitude of VA FSP participants from 1991 through 1993 to the following statement concerning forest stewardship certification, "I wanted to impress people" (arrow represents mean respondent attitude based on numeric conversion where strongly disagree = 1, disagree = 2, not sure = 3, agree = 4, and strongly agree = 5).

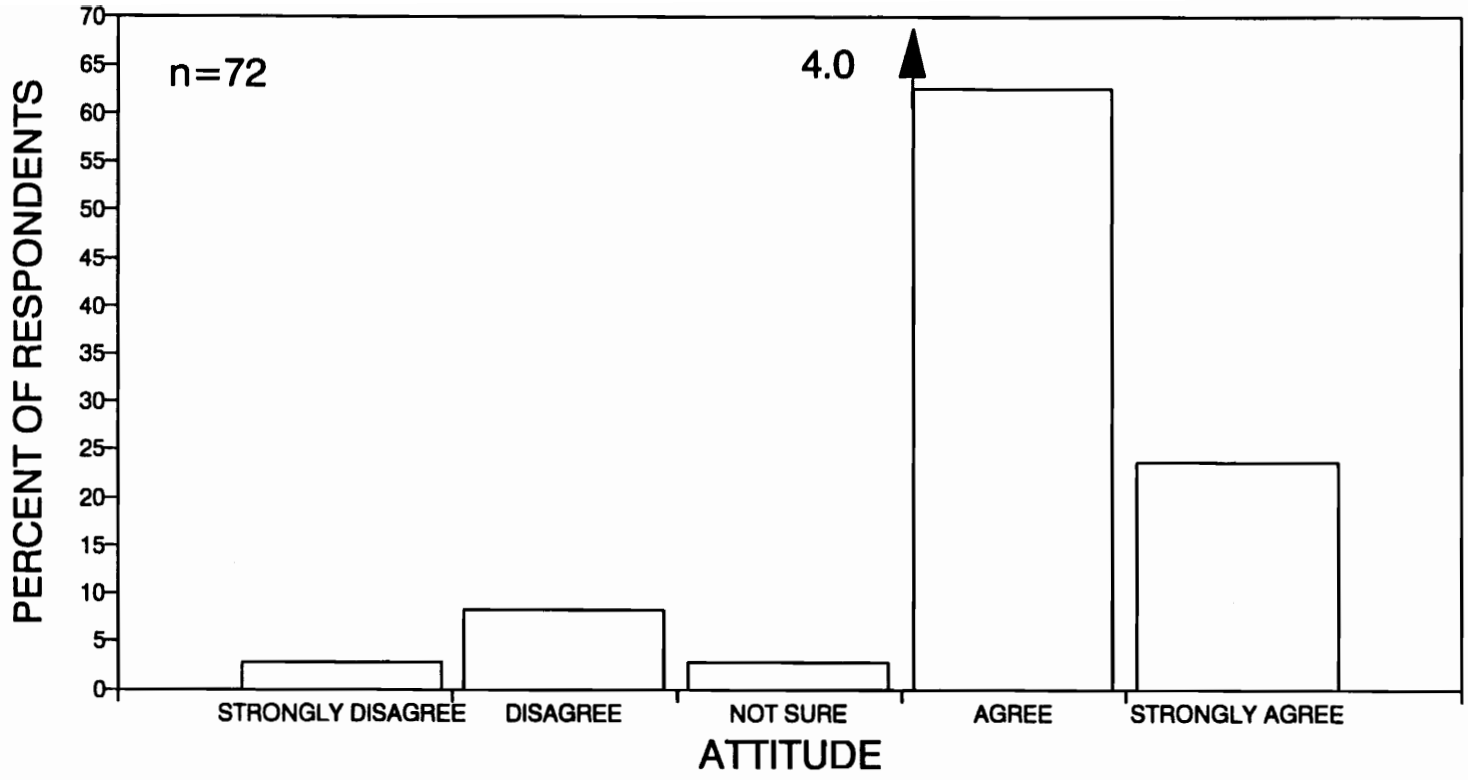

Figure 67. Expressed attitude of VA FSP participants from 1991 through 1993 to the statement, "Certification motivates me to implement the plan's recommendations" (arrow represents mean respondent attitude based on numeric conversion where strongly disagree = 1, disagree = 2, not sure = 3, agree = 4, and strongly agree = 5).

Communication between FSP participants and VDOF most often involved a phone call (72.9%), but also took the form of site visits (63.2%), letters/ correspondence (44.5%), newsletters (21.3%), and questionnaires (8.4%) ($\underline{n}$ = 155). Site visits occurred more often for respondents who entered the FSP in 1991 and 1992 than in 1993 (K-W X^2 = 10.702, df = 2, $\underline{P}$ = 0.005). Site visits also occurred more often in the Piedmont region than in the Mountain region, and, significantly so, the Coastal region (K-W X^2 = 6.307, df = 2, $\underline{P}$ = 0.130). The frequency with which letters/correspondence were used as follow-up communication tools appeared to differ among administrative regions (K-W X^2 = 11.546, df = 5, $\underline{P}$ = 0.042), however, multiple comparison tests could not identify the source of the difference in frequency of use of letters/correspondence. Occurrence of letters/correspondence did not differ among years or physiographic regions (K-W X^2 = 0.712, df = 2, $\underline{P}$ = 0.701; K-W X^2 = 1.756, df = 2, $\underline{P}$ = 0.416, respectively). There were no major differences among years, administrative regions, or physiographic regions for phone calls (K-W X^2 = 0.749, df = 2, $\underline{P}$ = 0.688; K-W X^2 = 2.300, df = 5, $\underline{P}$ = 0.806; K-W X^2 = 0.120, df = 2, $\underline{P}$ = 0.942), questionnaires (K-W X^2 = 0.646, df = 2, $\underline{P}$ = 0.724; K-W X^2 = 3.269, df = 5, $\underline{P}$ = 0.659; K-W X^2 = 2.418, df = 2, $\underline{P}$ = 0.299), or newsletters (K-W X^2 = 0.082, df = 2, $\underline{P}$ = 0.960; K-W X^2 = 5.936, df = 5, $\underline{P}$ = 0.313; K-W X^2 = 1.575, df = 2, $\underline{P}$ = 0.455).

CHAPTER 4
DISCUSSION

Non-response Bias

Non-response bias was not an important factor in the analysis of my results. Dolsen and Machlis (1991:276) reported that "...results from mail-back surveys of relatively homogeneous recreation populations that are defined in advance may yield useful data when at least [a] 65% response rate is secured, substantive response bias can be ruled out, and sampling error is assumed to be random." I assumed relative homogeneity for the population of FSP Coordinators of U.S. states and territories and for the population of Virginia NIPF landowners who entered the FSP from 1991 through 1993. My overall response rates were 90.2% (national) and 81.3% (Virginia). Substantive response bias was ruled out based on similar response rates from 1991, 1992, and 1993. Sampling error was assumed to be random because I sampled 70% of the population and selected subjects through a random sampling protocol. Therefore, I assumed I had no substantive non-response bias.

Forest Stewardship Program at the National Level

Validation of Results with Other Information

I found the percentage of NIPF ownership of forested lands in the U.S. states and territories to be 62.9%. Egan and Jones (1993) and Bliss (1994) reported the percentage of NIPF ownership of forested lands to be 58% and 59%, respectively. I believe my figure is slightly higher because several key Western states, where the percentage of NIPF ownership is lower than in the North or South, failed to respond to

my survey. Powell et al. (1993) also reported a lower percentage of NIPF lands in the West than in the North or South.

In my survey, FSP Coordinators from the 12 Southern states reported that 7,520 stewardship plans representing 709,104 ha had been prepared as of January 1, 1994. The Southern Regional Extension Forestry Office (SREFO) (1994) reported that during fiscal years (FY) 1991 - 1993, 6,950 stewardship plans covering 634,213.33 ha had been enrolled in the FSP in the 13 Southern states. I did not include Virginia (FY 1991 - 1993: 1,085 plans, 77,392 ha) in my survey sample; including it would bring the number of plans up to approximately 8,500 covering over 786,000 ha. I believe the differences in total number of plans and area covered by the FSP that I calculated and those of the SREFO report are due to a difference in ending dates of summations (my survey: January 1, 1994; FY 1993: September 30, 1993). My results include 3 months not reported by the SREFO. Taking this discrepancy into account, I believe the 2 sets of figures are similar and making comparisons is justified.

Available NIPF Lands Under Stewardship

Despite differences among states in FSP design and implementation (as described in Chapter 3), after 3 years there were no differences regionally in the percentage of available NIPF lands under stewardship programming (see Table 2). Several exceptions were noted. In Guam, a very high percentage of NIPF lands (much greater than other states and territories) were included in the FSP, perhaps because Guam is so much smaller in area and has a low percent of NIPF lands available. Although they have written few plans in Guam, most of the NIPF land area has been covered by the FSP. Montana had the second greatest percentage of available NIPF area under planning (although much lower than Guam, it was still relatively high compared to other states). Montana's unique administration of the program, notably that all plans were prepared by landowners after they received stewardship workshop

training, possibly could explain this higher percentage. Logan (1994:88) reported that landowners in Montana learn to "...inventory [their] property resources, set goals and priorities for their lands, analyze trade-offs and understand environmental consequences of stewardship decisions, [and] develop their own stewardship plan and are motivated to implement that plan by putting into action the practices they have learned." States that have a very low percentage of available NIPF lands included in the FSP may learn from Montana and focus more on landowner education in the FSP rather than just the preparation of plans. At the other extreme, some states had very low percentages of available NIPF land under the FSP, such as Hawaii (0.14%), Connecticut (0.35%), Pennsylvania (0.48%), and Kansas (0.51%). These small percentages could be due to the small size of land holdings enrolled in the FSP in a state, such as Kansas (mean size of stewardship property: 5 ha). Landowners in states such as Kansas may be interested in the FSP, but individually may only own small land holdings. Lower percentages also may be due to lack of landowner interest in the FSP because of lack of interest or understanding of forested land management in general, lack of exposure to the FSP, or involvement in other management programs for their property. Another possible explanation would be that agencies in these states concentrate most of their agency programs on fire control, timber management, or pest control.

Stewardship Plan Preparation

Many questions arise about preparing stewardship plans such as (1) what are NIPF landowner expectations and what are they asking of the FSP, (2) what or how much information should be included in stewardship plans to satisfy landowners, (3) should all resource inventory information be included, or (4) do plans overemphasize any one resource (e.g., timber)? The FSP was designed not only to develop plans that meet specific landowner objectives, but also to heighten landowner awareness of all types of natural/cultural resources found on their property (i.e., take advantage of the

opportunity to educate). This does not appear to be occurring consistently in all states. This is reflected in the low frequency of inclusion of some types of natural/cultural resources information in stewardship plans and the high occurrence of follow-up communication initiated by landowners and for further assistance.

Landowner Objectives

In my national survey, I examined in detail only 1 broad landowner objective: wildlife enhancement. FSP Coordinators reported that general wildlife improvements were requested more often overall than either consumptive or non-consumptive wildlife use objectives, but consumptive use objectives were more frequent in the South and non-consumptive use objectives were more frequent in the West. Plan preparers, therefore, must be able to address not only traditional wildlife management issues regarding game species, but also management for other types of wildlife for non-hunting/trapping purposes. Although it might appear that preparers in different regions could concentrate on 1 type of wildlife objective more than another, in general, they must be well-rounded in their training or know where to obtain reliable assistance to address the variety of requests coming from landowners.

Plan Preparers

Although the FSP guidelines and standards stipulate that individuals from various occupations may potentially prepare stewardship plans, states ultimately choose who is allowed to prepare plans. Just because an individual or group of resource professionals is allowed to write plans does not mean that they actually prepare plans. The percentage of plans that each type of professional prepared confirms this. FSP Coordinators reported that only 1 or 2 types of professionals, usually a forester, prepared most or all of their stewardship plans (see Table 3). Seeing that most FSPs are administered by state Forestry Departments or Divisions, this is not surprising. It is probably easier to get preparers from within the administrating agency than to

coordinate non-departmental assistance. Potential plan preparers from other state agencies may be involved in their own agencies' programs limiting the time and interest they have in the FSP. Consultants' low rate of involvement in the FSP in many states may be due in part to low profit potential or lack of interest on the part of consultants. A low rate of consultants' participation in preparing stewardship plans may also arise because they may not qualify based on a state's specific standards or qualifications for plan preparers. However, their low rate of stewardship plan preparation might also be due to other administrative procedures, as those seen in Virginia. In Virginia, when an Area Forester receives "more requests [for stewardship plans] than he or she can service in the next 6 months, additional requests [are] referred to consulting foresters (Appendix E in Virginia Department of Forestry 1995c). Only after state foresters exceed the maximum number of plans they can prepare are consultants involved.

Due to the way my survey questions were structured, I was unable to determine whether preparers differed by category (e.g., state forester/biologist, forestry/wildlife consultant) in how they assessed resources or how often they included resource-specific information in their stewardship plans. (An alternative structure would have addressed questions concerning resource assessment and inclusion and plan preparers in separate questions for each preparer type.) However, plan preparers collectively relied heavily on traditional methods (e.g., on-site inspection) rather than on newer technologies (e.g., computer databases) to conduct resource inventories. This may be due to a lack of availability of databases an/or computers or training in their use. Maps were used mostly for soils and water-related resource assessment probably because maps for these resources are available and easily accessible. In general, no substantial differences were apparent in the frequency with which resource information was included in forest stewardship plans between states where foresters prepared the majority of plans and states where another type of professional had prepared the majority of plans nor states where plan preparers had to meet certain standards or qualifications and states where there were no standards or qualifications for plan preparers.

Among the various categories of plan preparers, foresters had the highest perceived need for help in addressing wildlife issues according to FSP Coordinators. I did not assess the perceived need for help in assessing other resources, but a lack of knowledge about or training in some resources might possibly explain the lower inclusion frequency of information on non-timber resources. Although wildlife information was included frequently in some plans, the FSP Coordinators perceived that plan preparers needed help in addressing wildlife issues. Therefore, there may be questions concerning whether the wildlife information included in plans is high quality.

Help in addressing wildlife issues had been received from various sources who may have been able to provide valuable information on wildlife resources to plan preparers. The frequency with which resource information was included in forest stewardship plans was not related to whom help was obtained from. I did not ask FSP Coordinators about training workshops designed to address preparers' need for help in assessing resources. States may have held, or may find benefit from holding, such workshops as a means to encourage the inclusion of more resource data in stewardship plans. Most plan preparers had sought help with basic wildlife knowledge or information and specific, technical wildlife management recommendations. Assistance with field inventory was not commonly requested, even though on-site inspections frequently were conducted to assess wildlife and fisheries resources. As encountered previously, there may be a question about whether the wildlife resources information included in stewardship plans was sound and high quality. Help with other wildlife or non-wildlife resources may have been sought. Preparers who have training in all resource types or have access to qualified resource personnel via interagency cooperation, may include resource data in stewardship plans more frequently than those who do not. Alternatively, as a means to increase the presence of resource information in stewardship plans, state administrators might consider rejecting plans administratively if plans lack information stipulated by FSP guidelines.

Wildlife Recommendations

The frequency of appearance of wildlife management recommendations in forest stewardship plans varied regionally. In some cases, this probably was due to the appropriateness of a recommendation in a given region. For example, planting of hedgerows/windbreaks was more common in the West than in the North or South. This would be expected as hedgerows, windbreaks, and shelterbelts are more common to the agricultural fields and open plains of the West than in the forests of the North and South. The low frequency of use of some wildlife management techniques also may have been due to the type of wildlife objectives requested by landowners in a given region (i.e., consumptive wildlife objectives were more frequent in the South than in the North or West). Additionally, some variations could be due to the different emphasis or direction of a particular state's FSP. For example, Guam reported that wildlife was not "an issue"; rather, their emphasis was "farm forestry." Similarly, Nebraska reported that the recommendations included in their stewardship plans generally were based on the type of recommendations that would be covered by cost sharing available through SIP. The fact that foresters prepared most plans also may have influenced the types and frequencies of recommendations included in stewardship plans. If foresters are not adequately trained in wildlife issues (as noted previously), there may be a tendency to rely continually on a small set of "standard" or generic recommendations (such as creation of edge or development of food plots) to address landowners' wildlife objectives without adequately understanding their use or appropriateness.

Although the National Association of Professional Forestry Schools and Colleges (NAPFSC) expressed concern that improvement practices have been implemented on only about 3% of NIPF enrolled in the FSP (Gunter 1995), a majority of FSP Coordinators perceived that landowners frequently were implementing the wildlife recommendations they received in their stewardship plans, including activities promoting general, consumptive, and non-consumptive wildlife uses (I did not ask

about the rate of implementation of specific recommendations). This discrepancy could be due to many things. For example, there may have been a misperception by FSP Coordinators about the rate with which landowners were implementing wildlife recommendations, the NAPFSC may have taken all recommendation types into account, whereas FSP Coordinators were reporting only wildlife recommendations, or the NAPFSC may have been aware only of implementation that included SIP monies.

The effects of wildlife recommendation implementation will vary by species. Some wildlife species are very adaptable and will benefit from most habitat enhancements whereas other species will not. For example, creation of edge, one of the most frequently recommended management techniques, can benefit deer (*Odocoileus* spp.) by providing additional browse. Certain song birds will respond to improved nesting habitat. However, edge also can be detrimental to some songbird species due to increased nest parasitism by brown-headed cowbirds (*Molothrus ater*) and predation upon nests by other species in edges (Robinson and Bolen 1989). Patton (1992:203) reported that "while game species such as the white-tailed deer benefit from edge, nongame species or species needing large blocks of land with interior habitats often do not." If landowners continue to implement the most frequently recommended recommendations (creation of snags, edge, foodplots, and mast producing species) game species may benefit more than nongame species although landowners expressed the greatest amount of interest in general wildlife improvements.

Follow-up Communication

Landowners initiated follow-up communication as often as FSP agencies did. Follow-up with landowners most often was to provide further assistance to landowners. There is some indication that landowners will not be able to understand or implement stewardship plans without further assistance and information. Without follow-up communication to provide further instruction and encouragement where needed, the time and effort spent on preparing plans may be wasted (plans may sit on landowners'

shelves). Landowners should be asked if they understand their plan soon after they receive it and, if a landowner does desire to implement the recommendations received, plan preparers should recheck for understanding of recommendations and provide advice on acquiring equipment or personnel needed for implementation. West et al. (1988) reported that personal contact is more effective than mailings in transferring specific NIPF management advice, especially in terms of gaining adoption of such advice by NIPF landowners.

The Forest Stewardship Program in Virginia

FSP participants from 1991 through 1993 that I surveyed are a subset of the total NIPF landowner population in Virginia. In 1990, Hodge (1993) collected information about that larger pool of NIPF landowners for the VDOF. Hodge gathered information through "...a mail survey sent to NIPF landowners in 6 randomly-chosen forested counties in Virginia" (Hodge and Southard 1992:8). There were 2 counties from each of the 3 major geographic regions of Virginia described as subgroups in my Virginia survey. In the following pages, I shall examine and describe similarities and unique differences between these populations, based on Hodge and Southard (1992) and Hodge (1993), and my survey.

Demographics

Age

Hodge (1993) reported that approximately 50% of the general NIPF landowner population was $\geq$60 years old. Although only 30% of FSP participants from 1991 through 1993 were $\geq$60 years old, the distribution of respondent's age was similar to that described for the general population of NIPF landowners in Virginia (Hodge 1993). Hodge and Southard (1992:11) reported that "...there is a good possibility that

a significant amount of forested land may change ownership over the next 15 to 20 years because 50% of those responding [to Hodge's NIPF landowner survey] (were) over 60." Although not as many FSP participants were >60 years old, future changes in ownership of stewardship properties might still be a concern. If new landowners do not wish to be in the FSP, the original plan and any work initiated to accomplish any recommendations may have been done in vain (except possibly in cases where the work done has long-term impacts or benefits, such as a clearcut). The VDOF should encourage FSP participants to inform anyone who acquires property from them that is enrolled in the FSP about the original plan and, where necessary, have that plan modified to suit any change in objectives. Additionally, if the original property owner has received any cost-share support under SIP, there is a 10-year contractual commitment on the property regardless of any change in ownership. If the 10-year contract has not expired, the original landowner must reach mutual agreement with the new landowner to continue SIP practices or be prepared to return any SIP monies invested should the new owner not wish to continue the SIP contract.

Education

Education level of FSP participants from 1991 through 1993 was slightly greater than that reported by Hodge (1993) for the general NIPF landowner population. Approximately 20% more FSP participants had a Bachelor's degree or advanced college degree than did the general NIPF landowner population. Kellert (1980) reported that Americans with higher levels of education knew more about animals/wildlife and were more likely to be concerned with the naturalistic, ecologistic, and scientific aspects of wildlife. Landowners who become involved in the FSP may do so, in part, because of the knowledge and attitudes described by Kellert for individuals with high education levels. Landowner education and outreach programs by VDOF, Virginia Foresters Association, Cooperative Extension, and others may encourage increased FSP participation, not just in requesting plans, but also in plan

implementation. Knowledge or interest of landowners may not always lead to good management, but with professional resource managers helping landowners, wildlife will, hopefully, benefit.

Background

Most FSP participants who were raised in urban areas had advanced college degrees whereas most FSP participants who were raised on farms had, at most, a high school education. Landowners raised in urban areas may have had higher education levels because of opportunity or encouragement to pursue post-high school education. Landowners raised in urban areas also may have more money available to pay for higher education, or simply may have had more interest in continuing their education. A smaller percentage of FSP participants (20.4%) were brought up on a farm than were Virginia NIPF landowners (38.9%) and a much greater percentage of FSP participants (35.3%) were raised in suburban areas than were Virginia NIPF landowners (19%) (Hodge 1993). There are many potential explanations why fewer landowners from farm backgrounds have been involved in the FSP than those from other backgrounds. Perhaps they had less information about the FSP, did not understand the information they had as well as others who had more education, were busier and had less time available for the FSP, were closer to the land and did not need help in doing wildlife activities (they may have acquired wildlife knowledge from prior experience or from their elders), or had less interest in the FSP than those raised in suburban areas. I did not inquire about respondents' current living environments which may affect whether one enters the FSP.

Income

Hodge (1993) reported gross household incomes, whereas I reported net household incomes. FSP participants' net household incomes were slightly higher than Virginia NIPF landowners' gross household incomes. Although there were FSP

participants from even the lowest income range, FSP participants may have more money available to invest in forested land management than the general NIPF landowner. However, 46% of FSP participants from 1991 through 1993, from among all income levels, believed they did not have enough money to carry out the recommendations they received in their stewardship plans. I did not inquire about SIP participation among FSP participants. However, for many forest land management activities, monies may be acquired through SIP to help overcome financial barriers to implementing recommendations. Although some respondents reported that they did not believe they had enough money to implement recommendations, approximately 40 - 70% of landowners have initiated work on the various recommendations they received in their plans. The recommendations being implemented span a variety of practices and price ranges. It appears that landowners are initiating work on all types of recommendations, not merely those that are less costly to implement.

Size of Land Holding

Within Virginia, size of land holding varied among FSP participants and NIPF landowners in general. Fewer NIPF landowners (46.9%) owned <41 ha of forested land in Virginia than did FSP participants (57.3%), whereas more NIPF landowners (41.2%) owned 41 - 202 ha of forested land in Virginia than did FSP participants (34.9%). The percentage of Virginia NIPF landowners who owned >202 ha of forested land in Virginia (11.9%) also was greater than the percentage of FSP participants (7.8%) who did. The average amount of forested land owned in Virginia was greater for Virginia NIPF landowners (120.1 ha) than for FSP participants (72.8 ha). FSP participants from 1991 through 1993 who owned >202 ha had sought professional advice before entering the FSP more often than those owning <41 ha, and Hodge and Southard (1992:11) also reported that "...NIPF landowners with smaller parcels have less of a tendency to seek professional forestry assistance." However, over 50% of stewardship participants owned <41 ha of forested land. The FSP may

be reaching NIPF landowners that other programs did not attract or reach, or landowners who were not previously aware of any opportunities to receive advice or assistance. The Virginia FSP application requirement for minimum amount of forested land owned changed in 1995 from 8 to 4 ha. This may result in even more landowners with small land holdings participating in the FSP and receiving professional forestry advice. If landowners thought they did not own enough land to implement meaningful forest management, the lower minimum requirement may encourage them otherwise. I think it is important that the FSP reaches previously nonparticipating landowners with natural resource education and workable management suggestions (i.e., recommendations that can be implemented without causing a large monetary net drain). VDOF's mission is "a forest resource to meet the needs of the Commonwealth (Jim Starr, Chief of Forest Management, Virginia Department of Forestry, pers. commun.). As Americans face increasing demands upon their natural resources, NIPF landowners, whether they are looking for financial or nonfinancial benefits, can help ensure a healthy, prosperous forest for current and future generations under the FSP (Virginia Department of Forestry 1992). The FSP uses sound environmental and economic resource management principles to help landowners, and, if landowners implement good and appropriate management techniques for their properties, the Commonwealth is helped.

However, as land holdings decrease in size, the benefits acquired by the FSP for wildlife may not increase despite any increase in participation. The effects of wildlife management on small scattered plots may not have as great of a positive impact upon wildlife resources as management on fewer large contiguous parcels. Even where small parcels adjoin, differences in landowner objectives may conflict with or not compliment one another and be detrimental to wildlife and other resources.

Objectives

Although the mailing list received from VDOF for FSP participants from 1991 through 1993 supposedly included only landowners recorded as having wildlife as their primary or secondary objective, 17 respondents reported wildlife as a lower priority than secondary. This discrepancy may be due to landowners incorrectly recalling the objectives they chose on their FSP applications or to landowners changing their objectives since entering the FSP. This discrepancy also may be due to unclear communication between the landowner and the VDOF during initial enrollment in the FSP, however, most respondents reported that they believed they were able to clearly convey their desired objectives to their plan preparer. The discrepancy may have been due to VDOF error in recording or entering information. I believe that good record keeping and clear communication are essential parts to the success of any program.

Overall, Virginia FSP participants' primary wildlife objective was the same as that most frequently reported by FSP Coordinators at the national level--general wildlife improvements. Virginia FSP participants' second most frequent wildlife objective type was the same as reported by FSP Coordinators of other Southern states--wildlife for consumptive uses. The types of wildlife objectives I asked about were very general, however many landowners may have had very specific wildlife objectives. Some landowners may desire recommendations for specific species, whereas other landowners may just desire to feel good about the way they treat their land. VDOF should continue to identify landowners' intentions for their land and resources, but landowners may lack the necessary knowledge to make clear the specific objectives they truly desire, especially if they do not know their options. VDOF needs to give landowners information (without bias) about various management objective options to inform and assist the landowners in choosing objectives.

Virginia Landowner Satisfaction with Their Stewardship Plan

FSP participants from 1991 through 1993 expressed satisfaction with their plan preparers and were pleased with the plan and recommendations they received. Although satisfaction overall was consistent for all years and regions (administrative and physiographic), respondents' attitudes toward certain satisfaction-oriented statements varied. For example, female respondents believed that the recommendations offered in their stewardship plans were not easy for them to understand. Females may have had little previous exposure to forest resources or activities due to personal interests and type (not amount of) educational background. With so few female respondents it is hard to determine any relationship between attitude and demographic variables for women. However, their lack of understanding may not be a major deterrent to overall implementation of recommendations because females represented only 12.9% of the surveyed population and most properties were owned jointly by husbands and wives (if the wife did not understand, it is still possible that the husband did). Additionally, respondents with net household incomes of $100,000 - 150,000 (10%) and those who lived >402.3 km from their stewardship properties (3%) believed their plan preparers had not communicated clearly with them during the planning process of their stewardship plan. Further, respondents who had owned their stewardship property >10 years (28%) believed the recommendations they received were impractical and almost impossible to implement. Although the exact relationships between the above landowner attitudes and demographic characteristics is unclear, and none of the above groups represent a majority of FSP participants, these attitudes may be of some concern to VDOF. VDOF still must clearly communicate with landowners and plan preparers must prepare stewardship plans that are easily understood by all FSP participants (e.g., possibly lowering the reading level of plans). VDOF should be sure to provide follow-up to check landowners' understanding of the plans they have received, make sure that landowners know that further information is available, and provide explanations where needed. Further questioning concerning experiences,

values, and attitudes of landowners may be useful in revealing the root of relationships between landowners' attitudes and demographics, like those seen above.

Stewardship plans prepared by consulting foresters often did not satisfy the desired objectives of landowners. Although consulting foresters prepared a small percentage of plans (6%), they are likely to be preparing more in the future if demand for the FSP continues to grow. Whether landowners lack of satisfaction was due to confusion over who actually prepared the plan or to real differences in the type of recommendations given by consulting foresters is unclear. However, the percentage of plans prepared by the various preparers, as reported by respondents, did not differ substantially from Virginia Department of Forestry (1995b) internal figures (Virginia Department of Forestry: 91.6% vs. 90.1%, consulting foresters: 6% vs. 7.8%, and industrial foresters: 0.5% vs. 2% respectively). Thus, it does not appear to be a problem of landowner recollection. Consulting foresters did recommend certain wildlife management techniques, such as "daylighting" of roads and establishing mast producing species, more often than other preparers. Whether these recommendations were appropriate to the landowners' objectives or site-specific conditions of their property is unknown. Additionally, relationships between plan preparer and frequency of appearance of 50% of the common wildlife management techniques I asked about were inconclusive due to insufficient cell sample sizes. Despite the relationships noted above concerning satisfaction issues, overall FSP participant attitude toward satisfaction statements was overwhelmingly positive.

As Filion (1981) pointed out, wording of questions in surveys can have a significant effect on results and interpretation. Belson (1966) reported that reversing rating scales results in a shift in the degree of favorableness of respondents. Schuman and Presser (1977) showed that the tone of words also causes shifts in the favorability of respondents to statements. This was apparent with respondents' attitudes regarding understandibility and practicality of recommendations where the responses I received varied. Survey participants were presented with 2 somewhat related statements ("The

recommendations offered in the plan were easy for me to understand" and "The recommendations were too difficult for me to understand") in different sections of the survey. More individuals responded to the first statement (which appeared earlier in the survey) and a slightly greater percentage of them agreed with the first statement than disagreed with the second statement. Survey participants also were asked for their belief/reaction on 2 other similar statements, "The recommendations were impractical and almost impossible to implement" and "The recommendations were impractical." Again, more individuals responded to the first statement (which appeared earlier in the survey) and a greater percentage of them disagreed with the first statement than did with the second statement. In both situations, fewer individuals responded to the questions that appeared later in the survey. Due to the length of the survey or perhaps the grouping of attitude (i.e., Likert) questions, respondents may have skipped questions or groups of questions that appeared complex (not simple "yes or no" questions) toward the end of the survey. Response also may have been influenced by the nature of content around each of these statements. The first statement of each pair was presented in a section with positive statements addressing satisfaction, whereas the second statement in each pair was presented in a section with negative statements addressing impediments to recommendation implementation. Differences in percentage of respondents agreeing or disagreeing to statements that appear to address the same issue may, in fact, differ due to subtle differences in wording. One of the 2 statements addressing understanding of recommendations addresses the ease of understanding the recommendations whereas the other statement addresses the difficulty of understanding the recommendations. Not only did the second statement address whether the recommendations were difficult to understand, but whether they were <u>too</u> difficult to understand. Just because a respondent believed that recommendations were not easy to understand does not imply that they also believed that the recommendations were too difficult to understand. Differences in percentage of agreement with statements addressing recommendation practicality probably were due to the two-part nature of the

first statement. The first statement addressed not only practicality in terms of impractical versus practical, but also the impossibility of implementation. The 2 thoughts contained in this statement were really addressing 2 issues. One does not always imply the other.

Resource Information

Site-specific information about natural resources found on a property was included in stewardship plans less often than the resources were inventoried during stewardship plan preparation. The disparity between how frequently resources were inventoried (as reported by David Coffman, VA FSP Coordinator, and Jim Starr, Chief of Forest Management, Virginia Department of Forestry, pers. commun.) versus how frequently resource data or information stemming from the inventory actually appeared in stewardship plans (as reported by survey respondents) was as follows: historical and cultural--61-80% vs. 12.9%; recreational and esthetic--61-80% vs. 68.6%; non-timber--41-60% vs. 51.4%; soils--81-100% vs. 68.6%; T&E species--81-100% vs. 24.3%; timber--81-100% vs. 93.8%; water and wetlands--81-100% vs. 68.6%; wildlife and fisheries--81-100% vs. 89.5%. Although U.S. Forest Service guidelines stipulate that these natural resources should be inventoried and described in stewardship plans, plan preparers may have described only those specifically relating to a landowner's objectives or simply described resources with which they were most familiar. Differences could also be due to preparers not including descriptive information in stewardship plans they prepared even if the resource was inventoried. Perhaps VDOF administrators over-estimated the frequency with which resources were being inventoried. VDOF initiated training workshops for stewardship plan preparers in Fall 1992 that included classroom and in-the-field instruction on historical, T&E species, and wildlife resources (David Coffman, Virginia Department of Forestry, pers. commun.). Although the frequency with which resource information was included in stewardship plans during 1993 did not improve noticeably, sufficient time likely had

not passed to monitor adequately the impact of training on plan content. Hopefully, training has increased the quality of resource information contained in plans and elevated the level of familiarity with these resources among preparers since then. In addition to the training sessions, VDOF also developed a new stewardship plan preparation handbook in 1994 to insure standardization and that certain resource information will be included in all plans.

The difference between the frequency of inventory vs. frequency of inclusion of pertinent information about a resource also may have been due to respondent error in reporting information that was included in their plan or their failure to report whether information had been included or not, simply because they do not know what is in the plan. Response rates to questions concerning the inclusion of resource information was variable. Several respondents reported whether certain resources were included, but did not respond for all the listed resources. The percentages of respondents who either reported that they did not know or did not respond to a given resource were: historical and cultural--49%, non-timber plants--31.4%, recreational and esthetic--22.8%, soils--21.9%, T&E species--42.4%, timber--5.3%, water and wetlands--20%, wildlife and fisheries--7.6%. This may be a reflection of their attitudes about the value or importance of a resource, a lack of knowledge about a particular resource, or that landowners recalled only information in which they had interest. Historical and cultural and T&E species resources, which had the greatest percentage of respondents who either reported that they did not know or did not respond concerning inclusion of information in stewardship plans, had the greatest discrepancies between frequency of inventory and frequency of inclusion of information in stewardship plans. Therefore, it is likely that respondents who did not know, or did not respond, accounted for most of the noted discrepancies.

Wildlife Recommendations

The type of recommendations that appeared in Virginia stewardship plans and the frequency with which they were recommended, on which landowners initiated work, and on which landowners completed work varied considerably. The frequency with which a recommendation appears obviously is a reflection of landowners' specific wildlife objectives and site-specific conditions of their properties. However, respondents also reported differences in frequency with which they used recommendations according to who had provided wildlife recommendations. In part, this may be indicative of the level of knowledge or understanding about wildlife management practices of plan preparers.

There also may be a relationship between the frequency of appearance of wildlife recommendations and the possibility of receiving SIP cost-share monies for implementation. For example, in Virginia, developing or enhancing springs may be eligible for SIP funding whereas constructing ponds typically is not. Purchase and installation of plant materials and fertilizer also are eligible (Virginia Department of Forestry 1995d). These examples might help explain why developing food plots was so frequently recommended whereas providing a water source was not.

Although SIP monies are available for implementing many recommendations, funding is contingent upon a 10-year contract whereas stewardship plans only cover a 5-year period. A landowner will not be able to receive money for recommendations in his/her 5-year management plan if they are not willing to commit to 10 years of management activity. This lack of funding and the "red tape" involved in paper work (see Appendix G) theoretically could frustrate a landowner to the degree that they do not initiate any management activities on their property. Yet, within the first 3 years of the FSP, landowners in Virginia reported a high level of initiating and completing several types of recommendations (e.g., creating edge: initiated work--68.6%, completion of work--45.7%). Obviously, some recommendations (e.g., those associated with long-term timber management) are more complex or time consuming

and, even if initiated, would not reach completion in the short time since the FSP began. Unfortunately, I was unable to determine if there were any clear relationships between FSP demographics and the rate implementing recommendations.

The effectiveness of the FSP in terms of wildlife enhancement is a hard thing to measure. Landowners have expressed satisfaction with the plans they received, but questions should be asked during and after the 5-year management schedule to determine if any observable results are being obtained for landowners or wildlife. The effectiveness of implementing wildlife recommendations is hard to determine without information about the appropriateness of recommendations and original wildlife conditions. To determine impacts of wildlife techniques one may want to determine wildlife needs and population and habitat conditions, but this often is expensive and time consuming. The FSP may need to depend upon landowners' perceptions of success rather than the actual numbers or conditions of wildlife.

Impediments to Implementation of Wildlife Recommendations

Most respondents believed the recommendations they received in stewardship plans were not impractical or difficult to understand, that it was not difficult to find people to give them sound technical advice, and that advanced age and ill health did not make it hard for them to work outside. However, respondents who were $\geq$60 years old, had $\leq$a high school education, or who maintained family ownership of the stewardship property found age and health to be limiting factors to implementing the recommendations. Although most respondents (who entered the FSP in 1991-1993 and chose wildlife as their primary or secondary objective) were $<$60 years old and had $>$a high school education, a majority of Virginia NIPF landowners were $>$60 and had $<$a high school education (Hodge 1993). More landowners $>$60 years old and with $<$a high school education potentially could become involved with the FSP in the future and addressing issues of age and health in limiting recommendation implementation will become more important to VDOF. Although properties owned by older

landowners may be more likely to change ownership in the near future to landowners with different characteristics, VDOF still may need to provide more information on where to find help in implementing recommendation for remaining older FSP participants. They may also need to make opportunities and procedures for receiving SIP cost-share monies clear to older FSP participants because they reported money to be a limiting factor to recommendation implementation. Also, as mentioned previously, VDOF may need to lower the reading level of stewardship plans to ensure their understandibility by landowners.

Respondents' attitudes were polar concerning how hard it was to find trained or skilled help and whether they had the money, time, and equipment necessary to carry out the recommendations. Landowners who were raised in urban areas found it more difficult to find trained or skilled help than those in rural areas. This may be due to a lack of contact with skilled outdoor workers that landowners raised in farm, rural, and suburban areas may have exposure to. As noted earlier, fewer general NIPF landowners were raised in urban areas compared to FSP participants. In the future, if more NIPF landowners from non-urban areas become involved in the FSP, VDOF may not need to be as concerned with informing FSP participants about where to find skilled help, but there is a need now. If NIPF landowners with characteristics reflecting the general NIPF landowner population become involved with the FSP, they probably will report money as a limiting factor more often than previous FSP participants because the general NIPF landowner population reported lower incomes than the FSP participants from 1991 through 1993. The opportunity for SIP cost-share and the complications of SIP processes have been mentioned previously. If the income level of FSP participants decreases, reflecting the lower incomes of the general NIPF landowner population, complaints about the SIP process probably will increase. There are also concerns about the continuation of SIP due to pending Congressional budget cuts (James Parkhurst, Assistant Professor, Virginia Tech, pers. commun.). Respondents who did not consider their stewardship property to be their main residence reported that they lacked

the equipment needed to implement recommendations more often than landowners whose stewardship property was their main residence. Landowners who reside on their stewardship properties may already own equipment used for working the land, whereas landowners who do not reside on their stewardship property may live on smaller tracts away from their stewardship property and not find it as necessary to own such equipment. However, landowners who lived 80.2 - 402.3 km from their stewardship properties believed they lacked the equipment needed to implement recommendations while those living >402.3 km from their stewardship properties did not believe they lacked equipment. It is unclear why these groups differed in attitude toward equipment needs. Further questions concerning landowners possession of equipment used in wildlife management techniques may provide further insight.

Forest Stewardship Certification

Although 61% of respondents were aware of the opportunity for certification, only 38% had pursued certification. Certification is usually initiated by VDOF through monitoring landowners' implementation of recommendations, but landowners also can initiate the certification process. Most landowners stated that the intent of the certification program was clear to them, yet I wonder if that is really true. Landowners who had pursued certification did so to serve as a good example to other landowners and found that it motivated them to implement their stewardship plan's recommendations. Most landowners did not pursue certification only for self-gratification or to impress people. If landowners better understood certification and more were encouraged to pursue it, they also may find motivation to implement and complete the recommendations they received. However, landowners may lack an interest in certification if they are overwhelmed by the stewardship plans they receive. Although they may initially be interested in certification, they may end up doing nothing if they perceive that there is just too much to do. Also, the problems and

beliefs about age, equipment, money, and time mentioned previously (see Pages 149 - 152) may prevent implementing recommendations.

Follow-up Communication

Most FSP participants have had communication with VDOF, usually their Area Forester, about the FSP since they received their stewardship plans. However, when asked to provide further comments on Virginia's FSP (see Appendix H), many landowners expressed a desire for more contact. One landowner said, "I was advised that I would be hearing from the Department of Forestry, but never did, much to my dismay. I figured that the program was no longer active. I would sincerely like to continue with appropriate assistance." Landowners may need more than just a plan to follow. They may need continued encouragement and specific or targeted information. As VDOF increases the number of FSP participants, it likely will become more difficult to maintain personal contact with landowners enrolled in the program. VDOF has a stewardship newsletter, but some FSP participants reported that they did not receive it. If VDOF wants FSP participants to continue in stewardship after receiving their plans, they must maintain contact with them either by correcting newsletter problems or through additional site-visits, phone calls, or letters (possibly via the internet?). Respondents to a South Carolina survey of FSP participants also reported that more emphasis was needed in the FSP on publicity and communication (Melfi et al. 1995). Virginia FSP participants expressed a great desire for follow-up and, without it, VDOF may face a decline in FSP participation if previous participants discourage others from becoming involved. Although VDOF reported preparing 1,085 stewardship plans from 1991 - 1993, without follow-up communication, many of those plans may be useless to the landowners.

Future Research Needs

VDOF has expressed interest in improving the FSP and continuing it in the years to come. VDOF is committed to "a forest resource to meet the needs of the Commonwealth" (Jim Starr, Chief of Forest Management, Virginia Department of Forestry, pers. commun.). Knowing FSP participants' characteristics, beliefs and attitudes can help VDOF continue to improve their service to NIPF landowners in Virginia. To help accomplish this I offer the following suggestions on improving information or correcting shortcomings of my study:

The FSP is a multiple resource program. I have emphasized the wildlife aspects of the program in my assessment and evaluation. Future research should concentrate on other resource areas of the FSP to enable a well rounded evaluation of this many-sided program.

The discrepancies previously noted between the inventory and inclusion frequencies of resource information in stewardship plans highlights an important concern also noted in the following statement concerning my national survey: "This was tough to fill out because not all of this information resides in one office. The service foresters who have the personal contact with the landowners would have better numbers on practices and what is in the plans. FSP Coordinators may have misreported some of the information about their state's FSP" (Massachusetts' FSP Coordinator). The Illinois FSP Coordinator reported that "many of [their] responses were educated guesses!" However, FSP Coordinators were able to provide a baseline overview of the FSP at a national level. To assess the FSP further, I suggest that providers (i.e., administrators, coordinators, cooperators, plan preparers) and participants be questioned. However, researchers are constrained by financial and time limitations. In my survey, much information about plan preparers was too intertwined to determine specifics relating any one type of preparer to a particular resource assessment and inclusion and recommendation types and frequencies. Longer surveys

could have alleviated overlapping/intertwined questions, but may have decreased response rates and increased interpretation complications. Information and comparisons examining plan preparers could be examined more closely with more detailed, non-overlapping questions to FSP Coordinators or to plan preparers themselves who would be able to answer detailed questions concerning how they prepare plans. Information should also be gathered concerning whether plan preparers are receiving training in any resource assessment techniques other than wildlife and if they are receiving assistance from other agencies or personnel for non-wildlife resource information. Directly addressing plan preparers and landowners may have provided more accurate and detailed information. Questions I asked about landowners implementing recommendations at a national scale were very general and I suggest that each state's FSP agency assess the rate of implementation of various recommendations by their landowners.

I did not specifically address SIP participation by FSP participants in U.S. states and territories or in Virginia. Examining landowners' involvement in SIP could be useful in assessing implementation of stewardship plans. Determining landowners' impediments to becoming involved in SIP could lead to improvements in the program, and increased enrollment leading to increased management activity on NIPF. Information concerning SIP might be obtained from Consolidated Farm Services (formerly Agricultural Stabilization and Conservation Service) who administer SIP.

The Virginia survey provided baseline data concerning the FSP in Virginia. Small cell sample sizes, which precluded reaching meaningful conclusions from many comparisons in the Virginia data, may have been avoided with a larger sample size. However, I sampled 70% of the population and the homogeneity of certain characteristics of Virginia FSP participants would continue to limit some calculations despite an increase in sample size. My focus on only wildlife limited my sample size. Sampling a broader segment of the FSP participant population may reveal more information. Follow-up surveys would be useful to examine any change in trends of

landowner characteristics and implementation of recommendations. Future surveys also could include questions about landowners previous experiences with or actual understanding of forest resources. Questions might also address landowners' attitudes toward plan preparers other than clarity of plan preparation communication. Attitudinal questions concerning impediments should also address landowners' possible loss or lack of interest in the FSP or plans received and unwillingness to bear any risks of long-term investments. In the future, surveys would be useful to assess the effectiveness of implemented recommendations and any relationships between demographics and frequency rates recommendation implementation.

Summary

Despite differences in FSP design and implementation among states, the percentage of available NIPF land area enrolled in the FSP ($\bar{x} = 3.4\%$) did not differ regionally. FSP Coordinators reported that only 1 or 2 types of professionals, usually a forester, prepared over 80% of stewardship plans. However, NRCS personnel prepared all or most plans in Guam (100%) and Nevada (96%) and landowners prepared their own plan in Montana. State wildlife biologists prepared no more than 7% of any state's stewardship plans whereas consulting wildlife biologists prepared $\leq$25% of any state's plans. Among types of preparers, FSP Coordinators perceived that foresters had the greatest need for help in addressing wildlife issues. Most plan preparers had sought help with basic wildlife knowledge and specific, technical management recommendations, but not with field identification, even though site inspections were an integral component of many state programs. Plan preparers relied on traditional methods (i.e., site inspection) rather than on newer technologies (i.e., computer databases) to inventory important natural/cultural resources. Information describing each of the 8 resource areas outlined in the FSP guidelines was included in

$\geq$80% of the stewardship plans written in only 50% of the states surveyed. Information about soils, timber, and wildlife resources was included most frequently.

Landowners requested recommendations for general wildlife improvements more often than either consumptive or non-consumptive wildlife use objectives nationally, but consumptive use objectives were requested more frequently in the South and non-consumptive use objectives were requested more frequently in the West.

The frequency with which wildlife management recommendations appeared in stewardship plans varied among states and regions, due, in part, to the type of wildlife objectives requested by landowners, the appropriateness of a recommendations in a given region, the different emphasis or direction of a particular state's FSP, or the type of management activities that are eligible for SIP cost-share money. Overall, those appearing most often were creating and/or managing snags, creating edge, developing food plots, and establishing mast producing species. In the West, planting hedgerows, creating edge, creating and/or managing snags, and managing dead or downed wood were recommended most often. In the North and the South, establishing mast-producing species and developing food plots were recommended most often. However, creating edge was also one of the most frequent recommendations in the North whereas prescribed burning was one of the most frequent recommendations in the South.

Virginia survey respondents reported high satisfaction with Virginia's FSP. Almost all respondents (95%) believed that the plan preparer clearly communicated with them and that they were able to clearly convey their desired objectives to plan preparers during the preparation of their stewardship plans. An overwhelming percentage of respondents (96%) were pleased with the plans they received and found the recommendations easy to understand and not impractical or impossible to implement. Respondents also believed that the recommendations they received satisfied their desired objectives. Although respondents expressed overall satisfaction, they did face some impediments to initiating and completing work on the recommendations they received in their stewardship plans. The main impediments were lack of time, money,

and equipment needed to implement recommendations. Approximately one-half of respondents believed it was hard to find trained or skilled help. However, most respondents did not believe they had trouble finding people to give them technical advice. They also reported that the recommendations were neither impractical nor too difficult to understand. Respondents did not find it hard to work outside due to advanced age or ill health.

Although there may not have been substantial time between my survey and when the most recent Virginia FSP participants received their stewardship plans for them to begin on-the-ground work, and despite the previously mentioned impediments, respondents overall have initiated and/or completed work on several types of wildlife recommendations. Sixty-nine percent of respondents who had received "create edge" as a recommendation had initiated work on it and 46% had completed the work. Of those who had received "establish mast producing species" as a recommendation, 65% had initiated and 57% had completed the recommended work. Sixty-six percent of respondents who had received "construct of brush piles" as a recommendation had initiated the work and 46% had completed it. Initiation of work on wildlife-related recommendations ranged from 37 - 69% of landowners who received a given recommendation. VDOF reported that at least 28% of landowners in Virginia's FSP have implemented improvement practices through SIP (Virginia Department of Forestry 1995c).

Recommendations

Based on analysis of the Virginia FSP, I recommend (1) efforts to reach landowners who are male, 40 - 59 years old, and married, and who have at least some college education and a net household income of $25,000 - 49,000, (2) improved education of FSP participants concerning forest resources, management options, and where to find trained/skilled help and equipment to implement recommendations, (3)

increased efforts in landowner awareness and understanding of SIP and simplification of SIP procedures, and (4) increased efforts in follow-up communication. These recommendations address the assessment and evaluation of one of the segments (i.e., wildlife) of the multiple-resource FSP.

The majority of respondents who believed they were not restrained by the impediments I addressed in my survey were male, $\geq$40 years old, and married, and had a net household income of $25,000 - 100,000. VDOF should put their efforts into NIPF landowners who will most likely implement the stewardship plans they receive.

To be successful, a FSP must not only reach "new" landowners (i.e., those without plans) and provide them with sound management plans, but management strategies recommended by those plans need to be acted upon by landowners. The NAPFSC has expressed concern that improvement practices have been implemented only on 2.7% of the land that had been enrolled in the FSP from 1991-1994 (Gunter 1995). However, Virginia leads the nation in implementation with 15% of the lands enrolled in the FSP (representing 28% of the landowners) in SIP conservation practices during the first 4 years of those programs (Appendix M in Virginia Department of Forestry 1995c). To encourage implementation of recommendations, plans need to be based on landowners' individual objectives and priorities. However, as landowners learn more about their forest resources and management options, their objectives and priorities may change (Melfi et al. 1995). Plan preparers must educate landowners about their management options, but without introducing bias (e.g., a focus on timber by forestry consultants). Virginia may be able to increase implementation rates with more time invested in educating landowners and not just handing them management plans.

VDOF should consider increasing existing landowner education efforts through the encouragement and co-sponsorship of workshops, tours, or informational programs, such as they currently do with the Virginia Coverts Project and the Stewardship Field

Tours with VDGIF. Workshops might be designed specifically to help landowners understand and choose their management objectives.

"Pre-stewardship" education programs on helping landowners choose and communicate their objectives may enhance the implementation rate of recommended management practices. Educational programs given before and after stewardship plans are received also may increase landowners' understanding of the plans and recommendations they receive (i.e., understanding of forestry terms and principles). VDOF should aim to have not only easily understood recommendations, but overall plan clarity and readability. VDOF should continue to evaluate the appropriateness of the reading level of current stewardship plans and adapt appropriately to their audience.

Education efforts should also include information concerning where to find trained/skilled help or equipment for recommendation implementation. One-third of respondents believed that it was hard to find trained or skilled help for implementing recommendations and almost half of respondents expressed that they lacked the equipment needed to implement recommendations. Landowners who were raised in urban areas particularly need assistance with finding trained/skilled help. Those who do not consider their stewardship property to be their main residence or who live 80 - 402 km from their stewardship properties may particularly need assistance in attaining equipment for implementing recommendations.

Educating on SIP cost-share opportunities and application procedures may help landowners overcome financial impediments. Almost one-half of respondents believed they did not have enough money to implement the recommendations they received in their stewardship plans. Simplifying SIP application procedures also might encourage more landowners to become involved in SIP and implement their recommendations. Although some landowners from each demographic group reported a lack of money for recommendation implementation, older respondents ($\geq$60 years old) expressed a lack of money more often than younger respondents.

Follow-up communication seems to be the biggest area of concern for VDOF to address. Implementation rates are high, but there is room for improvement and landowners have expressed a strong desire for continued communication and information from VDOF. In follow-up communication, VDOF should be aware of the need to clearly communicate plans to older FSP participants and provide information on equipment availability and resource people to urban participants. VDOF might consider follow-up workshops instead of one-on-one follow-up to maintain personal contact, which newsletters do not allow. Landowners suggested that more personnel be involved to alleviate Area Forester caseloads in preparing stewardship plans and continuing follow-up communication with FSP participants. However, increasing the number of personnel is dependent upon budgets, which often are limiting. It appears that VDOF may be having difficulty keeping up with the current growth in the FSP in Virginia in demands for plans; the added demand for additional follow-up will put a heavy burden on already over-extended VDOF personnel (Jim Starr, Chief of Forest Management, VDOF, pers. commun.). VDOF has made changes to involve more non-VDOF personnel. Forestry consultants are writing all plans for properties >81 ha. However, FSP participants from 1991 - 1993 expressed communication troubles and dissatisfaction with plans received from forestry consultants. VDOF should consider holding training workshops for forestry consultants similar to those given to VDOF personnel who prepare plans.

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APPENDICES

APPENDIX A

States and U.S. Territories Grouped by U.S. Forest Service Regions and Subregions

States and U.S. territories, grouped by U.S. Forest Service regions and subregions (after Powell et al. 1993).

REGION 1 - WEST	REGION 2 - NORTH	REGION 3 - SOUTH
Subregion 1 - Pacific Coast	Subregion 4 - North Central	Subregion 6 - South Central
Alaska (AK)	Iowa (IA)	Alabama (AL)
American Samoa (AS)	Illinois (IL)	Arkansas (AR)
California (CA)	Indiana (IN)	Kentucky (KY)
Guam (GU)	Minnesota (MN)	Lousiana (LA)
Hawaii (HI)	Missouri (MO)	Mississippi (MS)
Oregon (OR)	Ohio (OH)	Oklahoma (OK)
Washington (WA)	Wisconsin (WI)	Tennessee (TN)
		Texas (TX)
Subregion 2 - Inter-mountain	Subregion 5 - Northeast	
Arizona (AZ)	Connecticut (CT)	Subregion 7 - Southeast
Colorado (CO)	Delaware (DE)	Florida (FL)
Idaho (ID)	Massachusetts (MA)	Georgia (GA)
Montana (MT)	Maryland (MD)	North Carolina (NC)
Nevada (NV)	New Hampshire (NH)	South Carolina (SC)
New Mexico (NM)	New Jersey (NJ)	Virginia (VA)[a]
Utah (UT)	New York (NY)	
Wyoming (WY)	Pennsylvania (PA)	
	Rhode Island (RI)	
Subregion 3 - Great Plains	Vermont (VT)	
Kansas (KS)	West Virginia (WV)	
North Dakota (ND)		
Nebraska (NE)		
South Dakota (SD)		

[a] Not included in survey mailings.

APPENDIX B

Virginia Cities and Counties Grouped by VDOF Administrative Regions

Cities and counties of Virginia, grouped by VDOF administrative regions.

REGION 1	REGION 2	REGION 3	REGION 4	REGION 5	REGION 6
Accomack	Caroline	Albemarle	Amelia	Alleghany	Abingdon
Brunswick	Charles City	Charlottesville	Amherst	Augusta	Bland
Chesapeake City	Chesterfield	Clarke	Appomattox	Bath	Buchanan
Dinwiddie	Essex	Culpeper	Buckingham	Bedford	Carroll
Greensville	Gloucester	Fairfax	Campbell	Botetourt	Dickenson
Isle of Wright	Hampton	Fauquier	Charlotte	Craig	Grayson
Norfolk	Hanover	Fluvanna	Cumberland	Floyd	Lee
Northampton	Henrico	Frederick	Farmville	Franklin	Russell
Portsmouth	James City	Goochland	Halifax	Giles	Scott
Prince George	King George	Greene	Lunenburg	Henry	Smyth
Southampton	King and Queen	Loudoun	Mecklenburg	Highland	Tazewell
Suffolk	King William	Louisa	Nottoway	Montgomery	Washington
Surry	Lancaster	Madison	Powhatan	Patrick	Wise
Sussex	Mathews	Nelson	Prince Edward	Pittsylvania	Wythe
Virginia Beach	Middlesex	Orange		Pulaski	
Waverly	New Kent	Page		Roanoke City	
	Newport News	Prince William		Roanoke County	
	Northumberland	Rappahannock		Rockbridge	
	Richmond City	Rockingham		Salem	
	Richmond County	Shenandoah		Staunton	
	Spotsylvania	Warren			
	Stafford				
	Tappahannock				
	Westmoreland				
	York				

APPENDIX C

Virginia Cities and Counties Grouped by Physiographic Regions

Cities and counties of Virginia, grouped by physiographic regions (after Hoffman 1969, harvill et al. 1977, Larner 1979).

MOUNTAIN	PIEDMONT	COASTAL
Alleghany	Albemarle	Alexandria
Augusta	Amelia	Accomack
Bristol	Amherst	Arlington
Bath	Appomattox	Caoline
Bland	Bedford	Charles City
Botetourt	Brunswick	Chesapeake
Buchanan	Buckingham	Essex
Carroll	Charlottesville	Gloucester
Clarke	Campbell	Hampton
Craig	Charlotte	Hanover
Dickenson	Chesterfield	Henrico
Floyd	Culpeper	Isle of Wright
Fredrick	Cumberland	James City
Giles	Danville	King George
Grayson	Dinwiddie	King William
Highland	Fairfax	King and Queen
Lexington	Fauquier	Lancaster
Lee	Fluvanna	Matthews
Montgomery	Franklin	Middlesex
Page	Goochland	New Kent
Pulaski	Greene	Newport News
Roanoke City	Greensville	Norfolk
Roanoke County	Halifax	Northampton
Rockbridge	Henry	Northumberland
Rockingham	Lynchburg	Portsmouth
Russell	Loudon	Prince George
Staunton	Louisa	Richmond City
Scott	Lunenburg	Richmond County
Shenandoah	Madison	Southampton
Smyth	Mecklenburg	Suffolk
Tazewell	Nelson	Surry
Waynesboro	Nottoway	Sussex
Warren	Orange	Virginia Beach
Washington	Patrick	Westmoreland
Wise	Pittsylvania	Williamsburg
Wythe	Powhatan	York
	Prince Edward	
	Prince William	
	Rappahannock	
	Spotsylvania	
	Stafford	

APPENDIX D

National Questionnaire

THE FOREST STEWARDSHIP PROGRAM

Promoting Sound Management

Department of Fisheries and Wildlife Sciences
College of Forestry and Wildlife Resources
Virginia Polytechnic Institute and State University
May 1994

FOREST STEWARDSHIP PLANS

Q. 1 To the best of your knowledge, what is the approximate acreage of all forested lands in your state?

_____acres

Q. 2 Of the forest acreage that you just described, please estimate the percentage that falls within each of the following categories of ownership.

_____% Federal ownership (e.g., National Park Service, Bureau of Land Management, U.S. Forest Service, U.S. Fish and Wildlife Service, Military lands, etc.)

_____% Other public ownership (e.g., state, county, city)

_____% Private industrial ownership

_____% Private non-industrial ownership

_____ Don't know

Q. 3 As of January 1, 1994, how many completed Forest Stewardship plans had been prepared for private non-industrial landowners in your state?

_____plans

Q. 4 What is the approximate total acreage represented by all of these plans?

_____acres

Q. 5 The U.S. Forest Service's standards and guidelines for administering the Forest Stewardship Program allow individuals from various occupations to potentially prepare stewardship plans. Please indicate for your state which of the following individuals are allowed to prepare forest stewardship plans, which have actually prepared plans, and the approximate percentage of plans that each category has prepared as of January 1, 1994. (Circle the best choice for each major category.)

	Allowed to prepare plans		Have prepared actual plans		Percentage of all plans
(a) State foresters	YES	NO	YES	NO	_____%
(b) State wildlife biologists	YES	NO	YES	NO	_____%
(c) Private consulting biologists	YES	NO	YES	NO	_____%
(d) Private consulting foresters	YES	NO	YES	NO	_____%
(e) Industrial foresters	YES	NO	YES	NO	_____%
(f) Other (please specify) _____	YES	NO	YES	NO	_____%
_____	YES	NO	YES	NO	_____%
_____	YES	NO	YES	NO	_____%

Q. 6 Does your state have any minimum standards or qualifications that must be met or satisfied by potential plan preparers before they can write stewardship plans? (Circle appropriate answer.)

NO [if NO, go to Q.8]

YES [if YES, go to Q.7]

Q. 7 Which of the following minimum standards or qualifications, if any, do potential Forest Stewardship plan preparers have to satisfy to write plans in your state? (Circle appropriate response for each of the following.)

(a) Complete and submit a formal application	YES	NO	UNSURE
(b) Take and pass a certification test	YES	NO	UNSURE
(c) Meet minimum education and/or knowledge criteria	YES	NO	UNSURE
(d) Demonstrate experience with professional certificate or license	YES	NO	UNSURE
(e) Other (please specify)			
_____	YES	NO	UNSURE
_____	YES	NO	UNSURE
_____	YES	NO	UNSURE

STEWARDSHIP PLAN PREPARATION

Q. 8 The U.S. Forest Service Stewardship Program guidelines suggest that each of the following natural/cultural resources be assessed during stewardship plan preparation. For each of these resources, what techniques are used by preparers in your state to assess the resource? (where Y=YES, N=NO, and U=UNSURE)

Resource category	Site inspection	Prior record of inventory	Maps	Computer database
(a) Historical and cultural interests, such as Native American or archeological	Y N U	Y N U	Y N U	Y N U
(b) Non-timber plant resources	Y N U	Y N U	Y N U	Y N U
(c) Recreational and esthetic	Y N U	Y N U	Y N U	Y N U
(d) Soils	Y N U	Y N U	Y N U	Y N U
(e) Threatened and endangered species	Y N U	Y N U	Y N U	Y N U
(f) Timber	Y N U	Y N U	Y N U	Y N U
(g) Water and wetlands	Y N U	Y N U	Y N U	Y N U
(h) Wildlife and fisheries	Y N U	Y N U	Y N U	Y N U

Q. 9 In cases where a natural/cultural resource is detected on a landowner's property, in what percentage of the plans prepared for those landowners do descriptive materials about that resource appear? (Please circle one response for each resource category.)

Resource category	Percentage of plans containing descriptive information				
(a) Historical and cultural interests, such as Native American and archeological	0-20%	21-40%	41-60%	61-80%	81-100%
(b) Non-timber plant resources	0-20%	21-40%	41-60%	61-80%	81-100%
(c) Recreational and esthetic	0-20%	21-40%	41-60%	61-80%	81-100%
(d) Soils	0-20%	21-40%	41-60%	61-80%	81-100%
(e) Threatened and endangered species	0-20%	21-40%	41-60%	61-80%	81-100%
(f) Timber	0-20%	21-40%	41-60%	61-80%	80-100%
(g) Water and wetlands	0-20%	21-40%	41-60%	61-80%	81-100%
(h) Wildlife and fisheries	0-20%	21-40%	41-60%	61-80%	81-100%

WILDLIFE

Q. 10 Please rank the following landowner objectives regarding wildlife according to the frequency with which landowners in your state have requested planning assistance, where 1 = most often and 3 = least often.

Objective	Ranking
(a) Wildlife enhancement for consumptive uses - such as hunting, fishing, and trapping	_____
(b) Wildlife enhancement for non-consumptive uses - such as viewing or photographing wildlife or communing with nature	_____
(c) General wildlife improvements - such as generic requests for "more and better" wildlife or improvements just because the landowners want to know animals are there	_____

Q. 11 Writers of stewardship plans may or may not have the specific expertise to properly address all of a landowner's objectives. As stewardship coordinator, have you perceived there being a need on the part of plan preparers for help in adequately addressing wildlife issues? (Circle your response.)

NO [if NO, then go to Q.13]

YES [if YES, then go to Q.12]

Q. 12 Please rate your perception of the need for assistance in addressing wildlife issues by those who can prepare forest stewardship plans in your state. (Circle your responses.)

	Strong	Moderate	Little	None	Not Applicable
(a) State foresters	1	2	3	4	5
(b) State wildlife biologists	1	2	3	4	5
(c) Private consulting biologists	1	2	3	4	5
(d) Private consulting foresters	1	2	3	4	5
(e) Industrial foresters	1	2	3	4	5
(f) Others (please specify)					
_____	1	2	3	4	5
_____	1	2	3	4	5
_____	1	2	3	4	5

Q. 13 To the best of your knowledge, have any of the individuals who have prepared stewardship plans in your state sought outside assistance in addressing wildlife issues? (Circle answer.)

NO [if NO, then go to Q.18]

YES [if YES, then go to Q.14]

Q. 14 Assistance on wildlife issues is available from various potential sources. Do you know where plan preparers in your state have sought such assistance? (Circle answer.)

NO [if NO, then go to Q.18]

YES [if YES, then go to Q.15]

Q. 15 Please identify the sources where stewardship plan preparers have sought assistance from. (Check those that apply.)

_____ Federal agencies (e.g., U.S. Fish and Wildlife Service, Environmental Protection Agency, Bureau of Land Management, Army Corp of Engineers, etc.)

_____ State agencies (e.g., Natural Resources or Fish/Game Department, Natural Heritage Program, etc.)

_____ University or Cooperative Extension Service

_____ Private wildlife consultants

_____ Private environmental groups (e.g., National Wildlife Federation, Nature Conservancy, Wild Turkey Federation, etc.)

_____ Professional organizations (e.g., Society of American Foresters, Wildlife Society, etc.)

_____ Other (please specify)

_____

_____

_____

Q. 16 Can you identify the type of assistance that stewardship preparers have sought from outside sources?

NO [if NO, then go to Q.18]

YES [if YES, then go to Q.17]

Q. 17 Please rate the following type of wildlife assistance according to how often each is sought.

Assistance sought	Very Infrequently	Infrequently	Occasionally	Frequently	Very Frequently
(a) Field assistance - such as inventory and identification	1	2	3	4	5
(b) Basic wildlife knowledge and/or information - such as life history needs and requirements	1	2	3	4	5
(c) Specific technical management recommendations	1	2	3	4	5

Q. 18 A variety of wildlife management techniques and practices can be chosen to satisfy a landowner's objectives. Below is a list of common wildlife management techniques and practices that might be used in forest stewardship plans. For each of the following, circle the number that reflects the relative frequency with which that technique appears in stewardship plans in your state.

Management practice	Very Infrequently	Infrequently	Occasionally	Frequently	Very Frequently
(a) Constuction of nest boxes/platforms	1	2	3	4	5
(b) Construction of brush piles	1	2	3	4	5
(c) Planting of hedgerows/ windbreaks	1	2	3	4	5
(d) Snag creation and/or management	1	2	3	4	5
(e) Dead or downed wood management	1	2	3	4	5
(f) Creation of edge	1	2	3	4	5
(g) "Daylighting" roads	1	2	3	4	5
(h) Development of food plots	1	2	3	4	5
(i) Prescribed burning	1	2	3	4	5

Management practice	Very Infrequently	Infrequently	Occasionally	Frequently	Very Frequently
(j) Clearcut as part of a timber management plan	1	2	3	4	5
(k) Clearcut for wildlife purposes only	1	2	3	4	5
(l) Creation of forest openings associated with a timber management plan	1	2	3	4	5
(m) Creation of forest openings for wildlife only	1	2	3	4	5
(n) Establishment of warm or cool season grass cover	1	2	3	4	5
(o) Establishment of mast producing species (hard or soft)	1	2	3	4	5
(p) Provision of a water source	1	2	3	4	5

AFTER THE PLAN

Q. 19 Within the first year after a Forest Stewardship plan is delivered to a landowner, will any communication between your agency and the landowner be made? (Circle your response.)

NO [if NO, then go to Q.23]

YES [if YES, then go to Q.20]

Q. 20 Please rate each of the following forms of communication in relation to the frequency with which your agency uses it as a means to provide follow-up. (Please circle your responses.)

	Very Infrequently	Infrequently	Occassionally	Frequently	Very Frequently
(a) Phone call	1	2	3	4	5
(b) Site visit	1	2	3	4	5
(c) Letter/ correspondence	1	2	3	4	5
(d) Questionnaire	1	2	3	4	5
(e) Newsletter	1	2	3	4	5

Q. 21 Please rate each of the following possible reasons as to why this communication occurs. (Circle your responses.)

	Very Infrequently	Infrequently	Occassionally	Frequently	Very Frequently
(a) Check for landowner's understanding of the plan or its recommendations	1	2	3	4	5
(b) Monitoring of activities/compliance (e.g., BMP's)	1	2	3	4	5
(c) Certification	1	2	3	4	5
(d) Further assistance	1	2	3	4	5
(e) Other (please specify) _____	1	2	3	4	5
_____	1	2	3	4	5
_____	1	2	3	4	5

Q. 22 Please indicate the percentage of communication that is initiated by your agency, by landowners, and by others.

_____% Agency

_____% Landowners

Others who may have initiated (please specify)

_____% _____

_____% _____

_____% _____

Q. 23 For those plans that provide specific recommendations on wildlife enhancement, rate the frequency with which you perceive landowners are actually carrying out each of the following activities. (Circle one answer for each activity.)

Activity	Very Infrequently	Infrequently	Occassionally	Frequently	Very Frequently
(a) Activities specifically promoting consumptive wildlife uses	1	2	3	4	5

Activity	Very Infrequently	Infrequently	Occassionally	Frequently	Very Frequently
(b) Activities specifically promoting non-consumptive wildlife uses	1	2	3	4	5
(c) Activities promoting general wildlife improvements	1	2	3	4	5

Q. 24 For landowners who have identified wildlife as their main objective, is implementation of all wildlife recommendations mandatory for a landowner to receive Stewardship Certification? (Circle your anwer.)

NO

YES

That completes the questionnaire. We appreciate your time and effort in helping us by providing your input. Do you have any comments on any subjects relating to the Stewardship Program that you believe should be investigated? (Provide comments below.)

_____

_____

_____

_____

_____

_____

_____

_____

_____

We will be tabulating your responses with those of stewardship coordinators from other states. Would you be interested in receiving a copy of the findings?

NO

YES [if YES, What address should the results be mailed to ?]

_____

_____

_____

_____

Thank you again for your time and effort in helping us!

APPENDIX E

Virginia Questionnaire

THE FOREST STEWARDSHIP PROGRAM

A Survey of Virginia Landowners

Promoting Sound Management

Department of Fisheries and Wildlife Sciences
College of Forest and Wildlife Resources
Virginia Polytechnic Institute and State University
July 1994

CHARACTERISTICS OF VIRIGINIA STEWARDSHIP LANDOWNERS

Q. 1 What is your sex? (Please circle the appropriate answer.)

A. female

B. male

Q. 2 What is your age? (Please circle the appropriate range.)

A. 20-29

B. 30-39

C. 40-49

D. 50-59

E. 60-69

F. 70 and over

Q. 3 Please circle the highest level of education you have completed or the one in which you are now enrolled.

A. No formal schooling

B. Grade school

C. High school

D. Associate Degree

E. Bachelor's degree

F. Advanced college degree (M.D., M.S., Ph.D., J.D.)

Q. 4 Are you currently married?

NO [if NO, go to Q. 7]

YES [if YES, go to Q. 5]

Q. 5 What is the age of your spouse? (Please circle the appropriate range.)

A. 20-29

B. 30-39

C. 40-49

D. 50-59

E. 60-69

F. 70 and over

Q. 6 Please circle the highest level of education your spouse has completed or the one in which he/she is now enrolled.

A. No formal schooling

B. Grade school

C. High school

D. Associate Degree

E. Bachelor's degree

F. Advanced college degree (M.D., M.S., Ph.D., J.D.)

Q. 7 What is the approximate net income (after federal and state taxes) of your household? (Please circle the appropriate range.)

A. Less than $25,000

B. $25,000 - 49,999

C. $50,000 - 74,999

D. $75,000 - 99,999

E. $100,000 - 124,999

F. $125,000 - 150,000

G. Greater than $150,000

Q. 8 Which of the following environments best describes your upbringing or background? (Please circle appropriate the response.)

A. Farm

B. Rural

C. Suburban

D. Urban/city

Q. 9 From where has your knowledge or understanding of wildlife and forest resources come? (Please circle all that apply.)

A. Literature (e.g., books, leaflets, magazines)

B. Formal education or training

C. Continuing education (workshops or training)

D. Boy/girl scouts, 4-H, or similar youth group

E. Professional or private associations or organizations

F. Parents or other family members

FOREST STEWARDSHIP PROPERTY

Q. 10 Is the home that you consider your main residence located upon the property for which your Virginia forest stewardship plan was prepared?

NO [if NO, go to Q. 11]

YES [if YES, go to Q. 13]

Q. 11 What is the approximate distance in miles from your main residence to the property for which you had your Virginia stewardship plan prepared?

_____miles

Q. 12 In what county and state is your main residence located?

_____county _____state

Q. 13 In what county is your Virginia stewardship property located?

_____county _____county (if overlap occurs)

Q. 14 Approximately how many acres of forested land do you own in states other than Virginia?

_____acres

Q. 15 How much of the acreage identified in Q. 14 has been enrolled in the forest stewardship programs of other states?

_____acres

Q. 16 Approximately how many acres of land do you own in Virginia?

_____acres

Q. 17 Approximately how many acres of your land in Virginia is forested?

_____acres

Q. 18 Approximately how many acres of your land in Virginia were included in your Virginia forest stewardship plan?

_____acres

Q. 19 How long has the property for which your Virginia forest stewardship plan was prepared been under your ownership/control?

_____years

Q. 20 Please circle the category that best describes the ownership of your Virginia stewardship property.

A. Sole ownership

B. Husband and wife ownership

C. Family partnership

D. Family corporation

E. Non-family partnership

F. Non-family corporation

Q. 21 Approximately how many days per year do you visit your Virginia stewardship property specifically to conduct natural resource management activities? (Please circle the appropriate range.)

A. 0-3 days

B. 4-7 days

C. 8-14 days

D. 15-30 days

E. More than 30 days

THE FOREST STEWARDSHIP PROGRAM

Q. 22 Prior to your interaction with the Virginia Forest Stewardship Program, had you received any professional advice about managing your forested property?

NO [if NO, go to Q. 25]

YES [if YES, go to Q. 23]

Q. 23 From whom did this advice come? (Please circle all that apply.)

A. Virginia Department of Forestry

B. Virginia Department of Game and Inland Fisheries

C. Natural Heritage Program of Virginia (Department of Environmental Quality)

D. University or Cooperative Extension Service

E. Private Professional Consultants

F. Soil and Water Conservation District

G. Other (please specify)

_____

_____

_____

Q. 24 For what reason(s) did you seek/receive professional advice? (Please circle all that apply.)

A. To prepare a comprehensive forest management plan

B. Help with timber resources

C. Help with wildlife resources

D. Help with fisheries resources

E. Erosion control / soil conservation

F. Water conservation

G.. Other (please specify)

_____

_____

Q. 25 How did you first hear about the Virginia Forest Stewardship Program? (Please circle the one best choice.)

A. Virginia Department of Forestry

B. Other state agency

C. Newspaper or magazine

D. Friend/relative

E. Other (please specify)

_____

_____

YOUR FOREST STEWARDSHIP PLAN

Q. 26 When you completed and submitted your stewardship application, what general objective(s) did you choose for your property? (Please rank the following objectives in order of your original priority, with 1 representing the highest and 8 the lowest priority.)

	Ranking
A. Historical and cultural interests, such as Native American and archeological	_____
B. Non-timber plant resources	_____
C. Recreational and esthetic	_____
D. Soils	_____
E. Threatened and endangered species	_____
F. Timber	_____
G. Water or wetlands conservation	_____
H. Wildlife and fisheries	_____

Q. 27 When you completed and submitted your stewardship application, what specific wildlife objectives did you choose for your property? (Please choose only one response.)

A. Wildlife enhancement for consumptive uses - such as hunting, fishing, and trapping

B. Wildlife enhancement for non-consumptive uses - such as viewing or photographing wildlife or communing with nature

C. General wildlife improvements - such as "more and better" wildlife or improvements just because you want to know the animals are there; for both consumptive and non-consumptive uses

For Q. 28 - 33, please circle the response that best describes your attitude about each of the following statements:

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
Q. 28 I had the opportunity to clearly convey my desired objectives during the preparation of my forest stewardship plan.	SD	D	NS	A	SA
Q. 29 The person who prepared my forest stewardship plan clearly communicated with me during the planning process of my stewardship plan.	SD	D	NS	A	SA
Q. 30 I was pleased with the plan I received.	SD	D	NS	A	SA
Q. 31 The recommendations offered in the plan were easy for me to understand.	SD	D	NS	A	SA
Q. 32 The recommendations were impractical and almost impossible to implement.	SD	D	NS	A	SA
Q. 33 The recommendations satisfied my desired objectives.	SD	D	NS	A	SA

Q. 34 Who prepared your Virginia forest stewardship plan? (Please circle the appropriate response.)

A. Virginia Department of Forestry staff

B. Private forestry consultant

C. Industrial forester

D. Do not know or recall

Q. 35 Where specific recommendations regarding the wildlife resources on your property were made in your Virginia forest stewardship plan, do you know from whom those suggestions were obtained?

NO [if NO, go to Q. 37]

YES [if YES, go to Q. 36]

Q. 36 From whom was information about the wildlife resources on your property and the recommendations in your stewardship plan obtained? (Please circle the appropriate response for each of the following.)

A. Virginia Department of Forestry	YES	NO	DON'T KNOW
B. Virginia Department of Game and Inland Fisheries	YES	NO	DON'T KNOW
C. Natural Heritage Program	YES	NO	DON'T KNOW
D. Private wildlife consultant	YES	NO	DON'T KNOW

Q. 37 Standards established by the U.S. Forest Service to implement and administer the Forest Stewardship Program state that certain natural resources must be inventoried and described as a part of the planning process. To the best of your knowledge, did information about each of the following natural resource categories appear in your Forest Stewardship Plan. (Please circle the appropriate response for each of the following.)

A. Historical and cultural, such as Native American and archeological	YES	NO	DON'T KNOW
B. Non-timber plant resources	YES	NO	DON'T KNOW
C. Recreational and esthetic	YES	NO	DON'T KNOW
D. Soils	YES	NO	DON'T KNOW
E. Threatened and Endangered Species	YES	NO	DON'T KNOW
F. Timber	YES	NO	DON'T KNOW
G. Water and wetlands	YES	NO	DON'T KNOW
H. Wildlife and Fisheries	YES	NO	DON'T KNOW

Q. 38 For each of the following wildlife enhancement or management activities, please indicate by circling YES or NO those activities that appeared as a recommendation in your 5-year plan of work, those activities that you have taken steps to initiate, and those activities for which the recommendations in the 5-year plan have been completed.

	Appeared as recommendation		Initiated work		Completed work	
A. Construction of nest boxes/ platforms	YES	NO	YES	NO	YES	NO
B. Construction of brush piles	YES	NO	YES	NO	YES	NO
C. Planting of hedgerows/ windbreaks	YES	NO	YES	NO	YES	NO
D. Creation and/or management of snags	YES	NO	YES	NO	YES	NO
E. Creation or placement of dead or downed wood	YES	NO	YES	NO	YES	NO
F. Creation of edge	YES	NO	YES	NO	YES	NO
G. "Daylighting" roads	YES	NO	YES	NO	YES	NO
H. Development of food plots	YES	NO	YES	NO	YES	NO

	Appeared as recommendation		Initiated work		Completed work	
I. Prescribed burning	YES	NO	YES	NO	YES	NO
J. Clearcut as part of a timber management plan	YES	NO	YES	NO	YES	NO
K. Clearcut for wildlife purposes only	YES	NO	YES	NO	YES	NO
L. Creation of forest openings associated with a timber management plan	YES	NO	YES	NO	YES	NO
M. Creation of forest openings for wildlife only	YES	NO	YES	NO	YES	NO
N. Establishment of warm or cool season grass cover	YES	NO	YES	NO	YES	NO
O. Establishment of mast producing species (hard or soft)	YES	NO	YES	NO	YES	NO
P. Provision of a water source	YES	NO	YES	NO	YES	NO

Among the management recommendations that you received in your plan, there may have been some that you were not able to implement or complete. For Q. 39-46, please circle the response that best describes your attitude about each of the following potential reasons why the management recommendations offered in your Virginia forest stewardship plan were not initiated or completed:

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
Q. 39 I don't have enough money available to implement or complete the recommendations.	SD	D	NS	A	SA
Q. 40 It is difficult to find people to give me technical advice.	SD	D	NS	A	SA
Q. 41 The recommendations were impractical.	SD	D	NS	A	SA
Q. 42 It is hard to find trained or skilled help.	SD	D	NS	A	SA
Q. 43 Due to advanced age or ill health, it is hard for me to work outside.	SD	D	NS	A	SA
Q. 44 The recommendations were too difficult for me to understand.	SD	D	NS	A	SA
Q. 45 I don't have time available to carryout the recommendations.	SD	D	NS	A	SA
Q. 46 I don't have the equipment needed to carryout the recommendations	SD	D	NS	A	SA

Q. 47 The Forest Stewardship Program gives landowners an opportunity to become certified forest stewards. Were you aware of this opportunity for certification?

NO

YES

Q. 48 Please circle the response that best describes your attitude about the following statement: "The intent of the forest stewardship certification program is clear to me."

Strongly disagree Disagree Not sure Agree Strongly agree

Q. 49 Have you pursued forest stewardship certification through the Virginia Forest Stewardship Program?

NO [if NO, go to Q. 54]

YES [if YES, go to Q. 50]

For Q. 50-53, please circle the response that best describes your attitude about each of the following statements about motivation for pursuing certification.

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
Q. 50 My certification serves as a good example to other landowners	SD	D	NS	A	SA
Q. 51 I wanted certification only for self-gratification	SD	D	NS	A	SA
Q. 52 I wanted to impress people	SD	D	NS	A	SA
Q. 53 Certification motivates me to implement the plan's recommendations	SD	D	NS	A	SA

FOLLOW-UP COMMUNICATION

Q. 54 Have you had any communication with the Virginia Department of Forestry about Forest Stewardship since you received your stewardship plan?

NO [if NO, go to end of survey]

YES [if YES, go to Q. 49]

Q. 55 With whom has the communication been?

A. Area forester

B. Forest stewardship coordinator

Q. 56 Please indicate the form of this communication. (Please circle all that apply.)

A. Phone call

B. Site visit

C. Letter/correspondence

D. Questionnaire

E. Newsletter

That completes our questionnaire. We appreciate your time and effort in helping us. Do you have any comments on any subjects relating to the Virginia Stewardship Program that you believe should be investigated/considered? (Please provide comments below.)

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

We will be tabulating your responses with those of other Virginia landowners involved in forest stewardship. Would you be interested in receiving a copy of the findings?

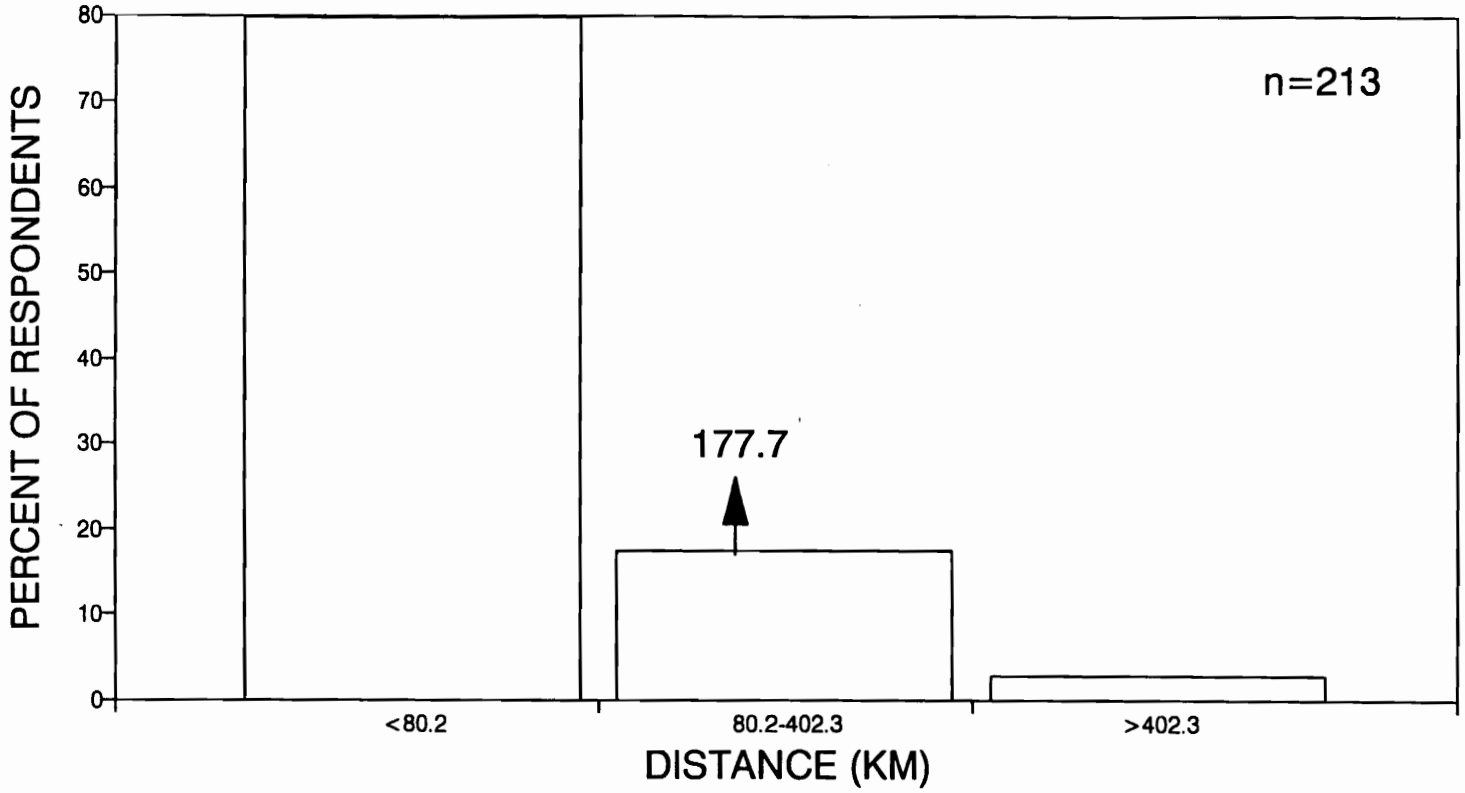
NO

YES

Thank you again for your time and effort in helping us!

APPENDIX F

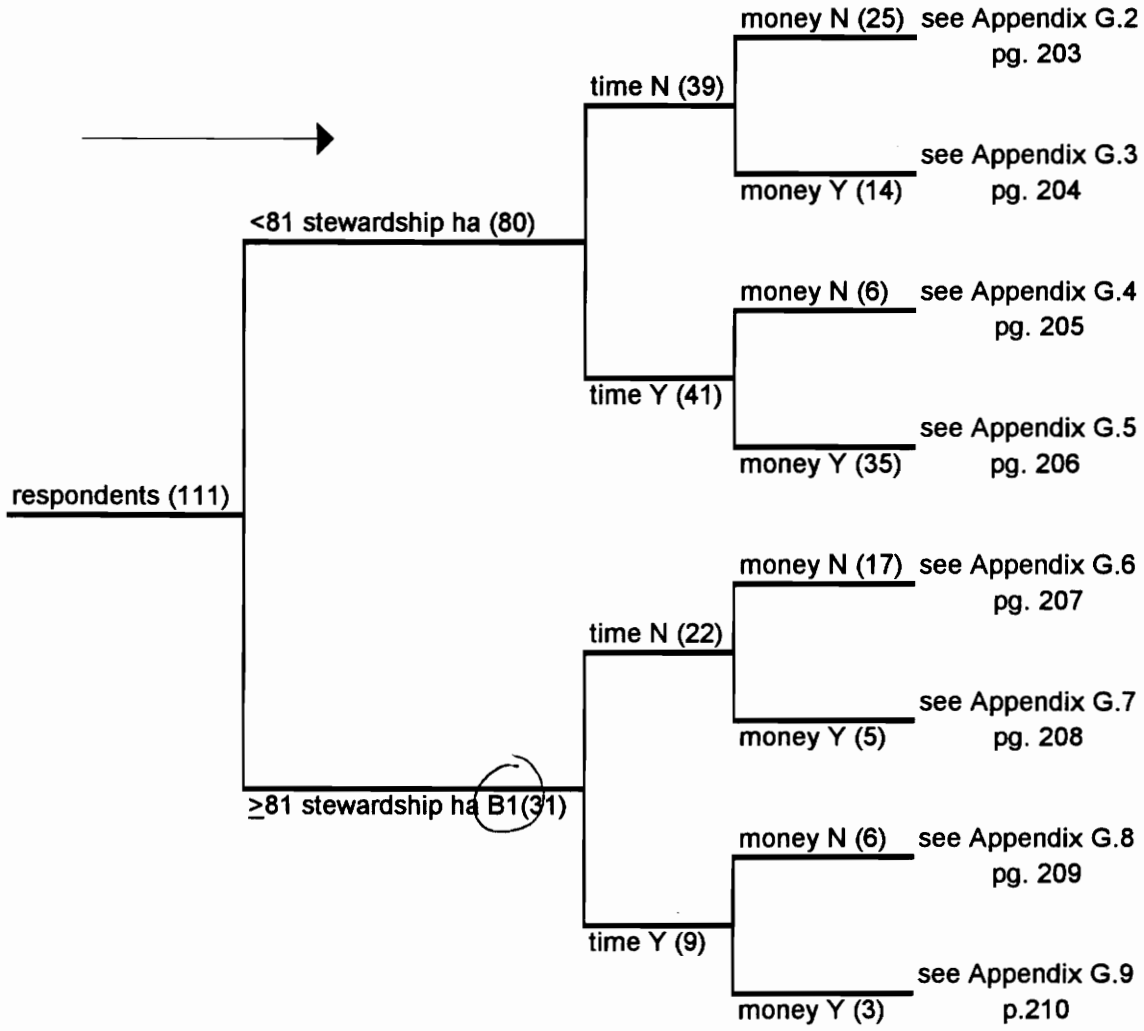
Distance from Main Residence to Stewardship Property



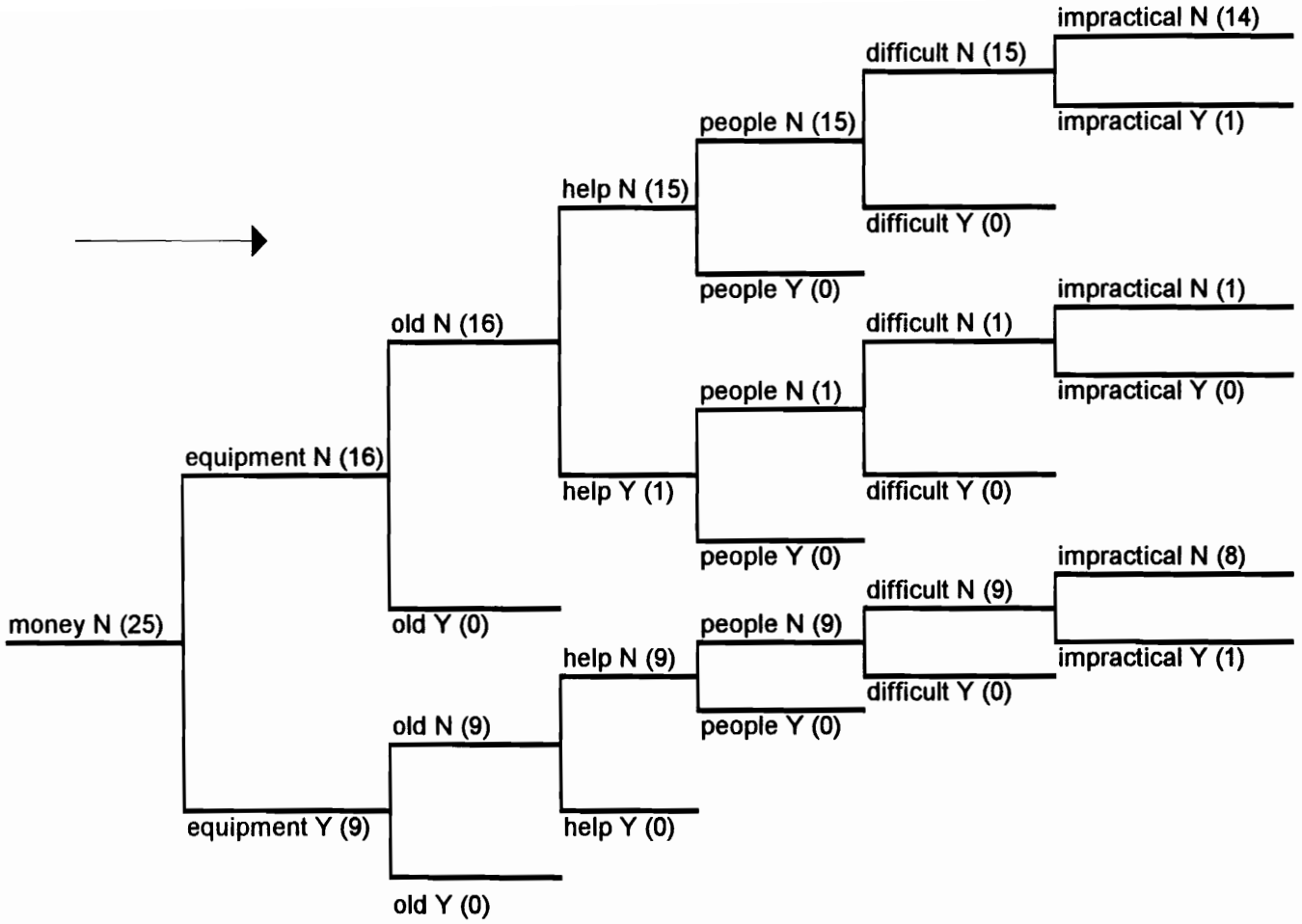
Distance from main residence to stewardship property for VA FSP participants from 1991 through 1993 who did not consider their stewardship property to be their main residence (arrow respresents mean).

APPENDIX G

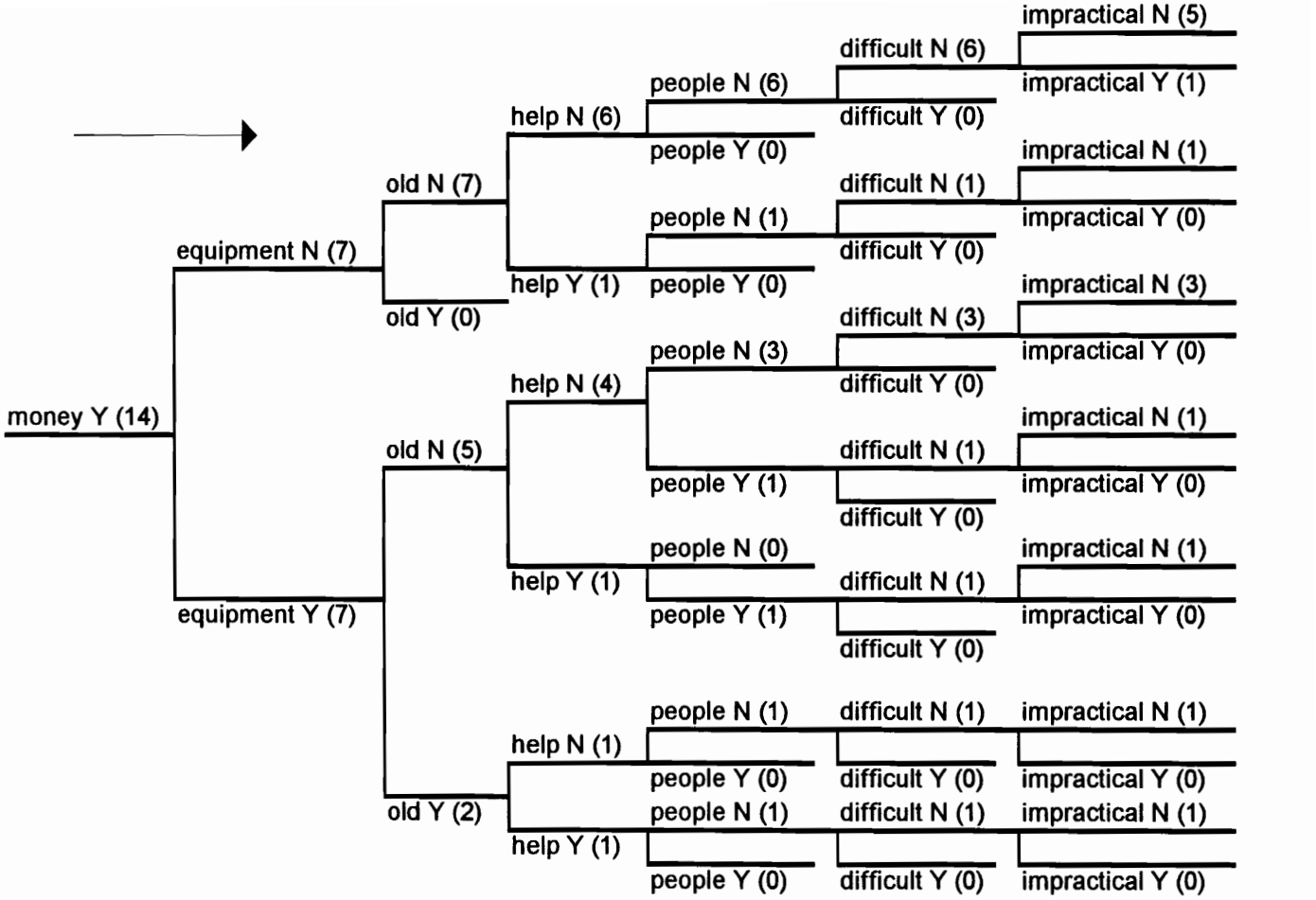
Dendrograms Showing Demographics and Identified Impediments to Implementing FSP Recommendations



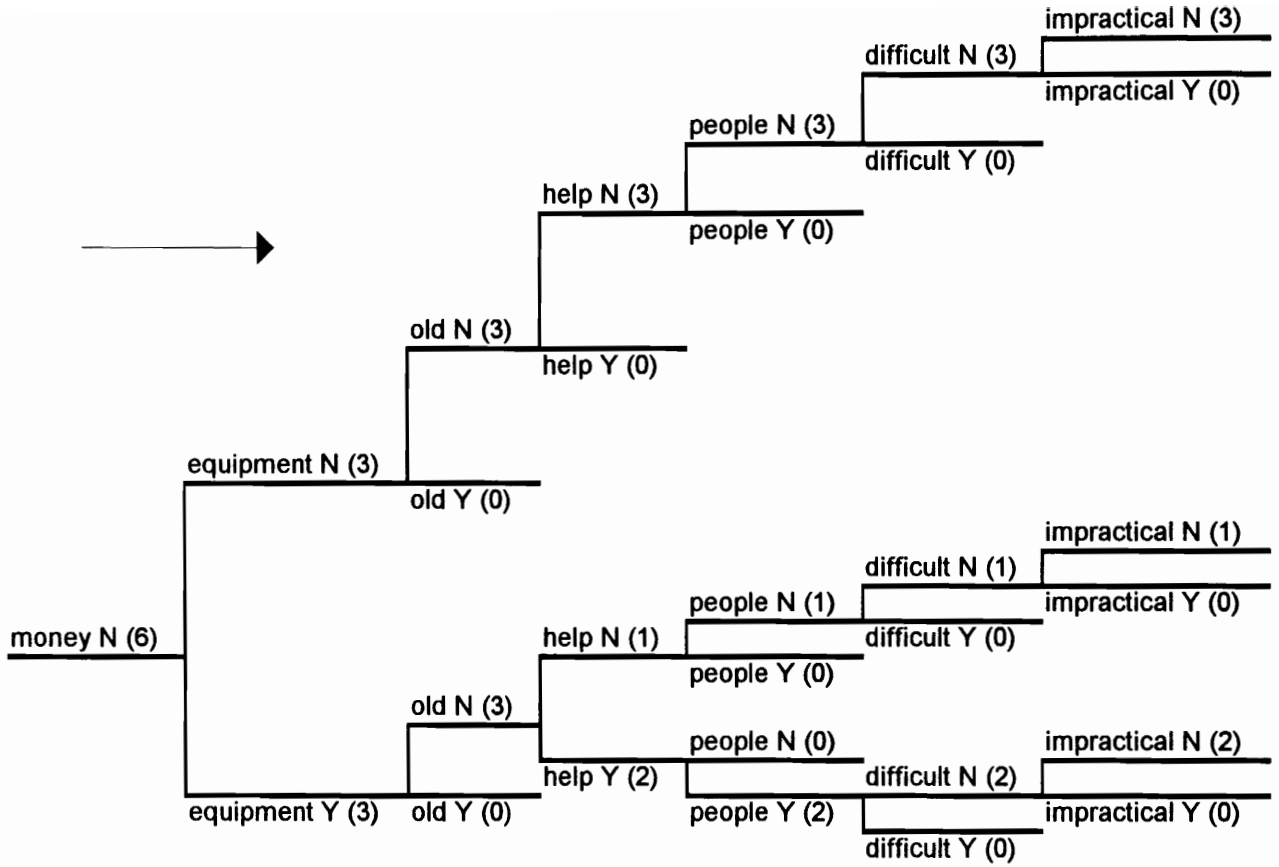
Appendix G.1 Dendrogram showing demographics and identified impediments to implementing FSP recommendations, where respondents = number of individuals responding to the 9 questions included in this appendix; stewardship ha = area owned in Virginia enrolled in the FSP; time = was time an impediment?; money = was money an impediment?; Y = yes; and N = no. Number in parentheses is the number of respondents.



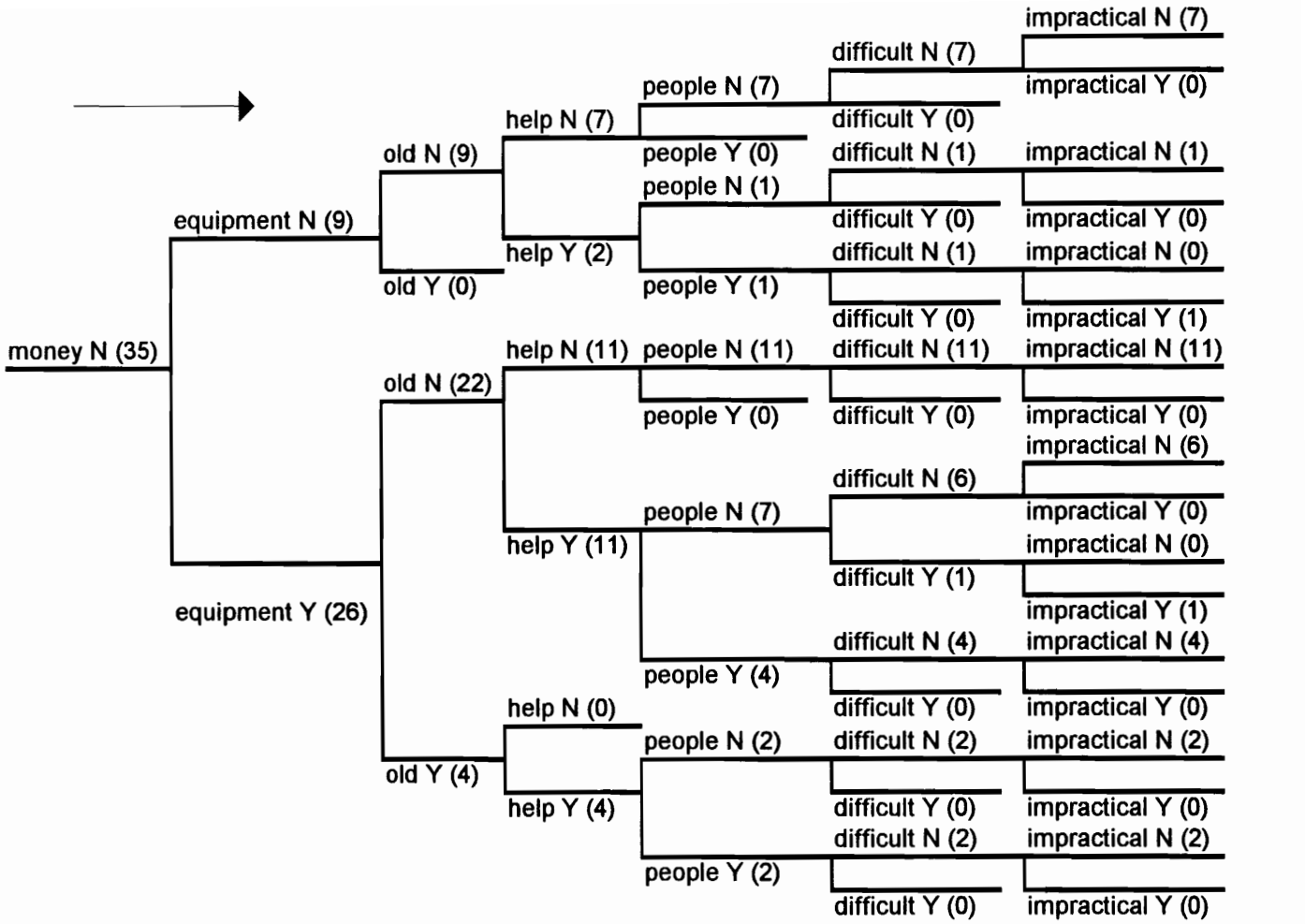
Appendix G.2. Dendrogram showing identified impediments to implementing FSP recommendations, where money = was money an impediment?; equipment = was equipment an impediment?; old = was age or ill health an impediment?; help = was it hard to find trained or skilled help?; people = was it difficult to find people who offer technical advice?; difficult = were the recommendations too difficult to understand?; impractical = were the recommendations impractical?; Y = yes; and N = no. Number in parentheses equals the number of respondents.



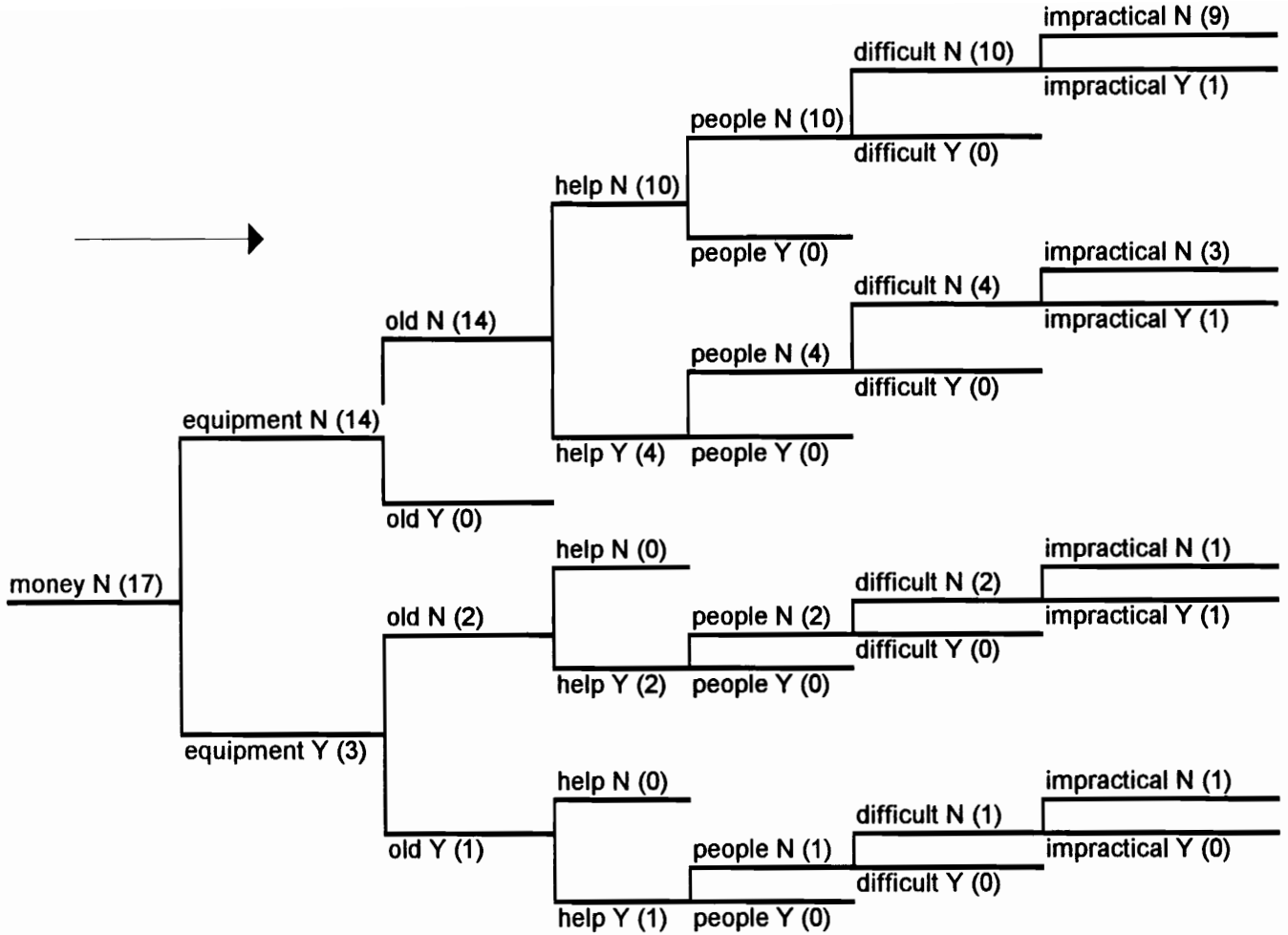
Appendix G.3. Dendrogram showing identified impediments to implementing FSP recommendations, where money = was money an impediment?; equipment = was equipment an impediment?; old = was age or ill health an impediment?; help = was it hard to find trained or skilled help?; people = was it difficult to find people who offer technical advice?; difficult = were the recommendations too difficult to understand?; impractical = were the recommendations impractical?; Y = yes; and N = no. Number in parentheses equals the number of respondents.



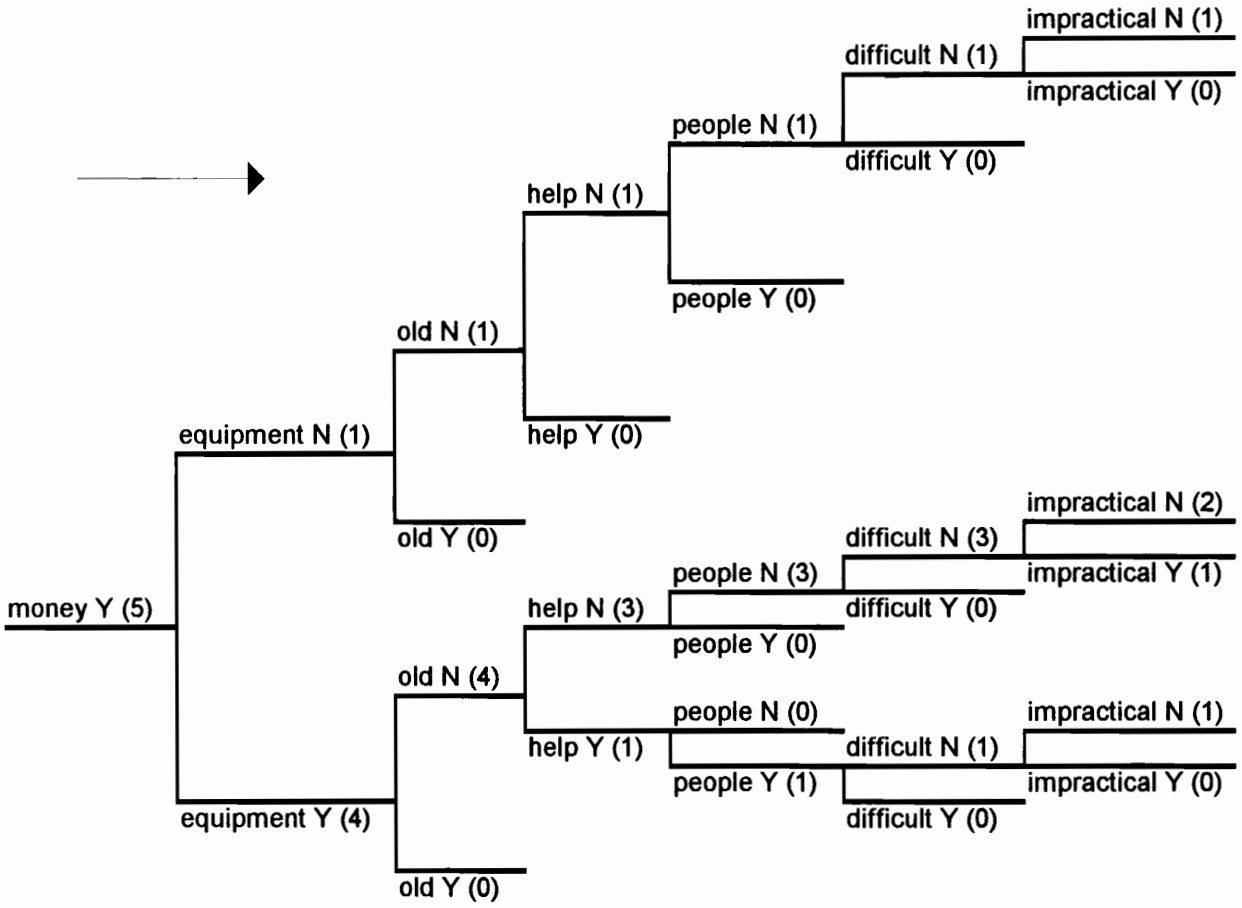
Appendix G.4. Dendrogram showing identified impediments to implementing FSP recommendations, where money = was money an impediment?; equipment = was equipment an impediment?; old = was age or ill health an impediment?; help = was it hard to find trained or skilled help?; people = was it difficult to find people who offer technical advice?; difficult = were the recommendations too difficult to understand?; impractical = were the recommendations impractical?; Y = yes; and N = no. Number in parentheses equals the number of respondents.



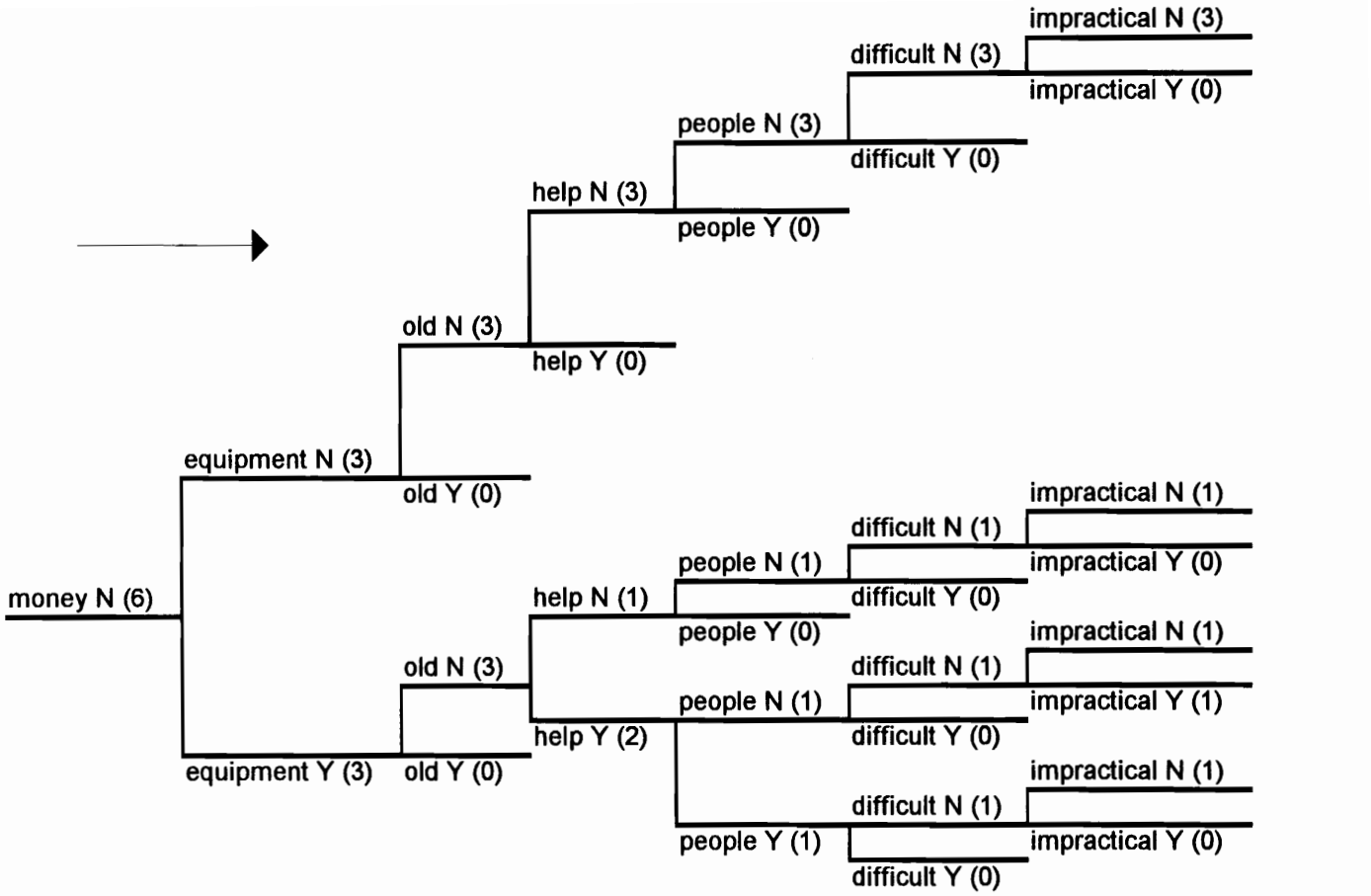
Appendix G.5. Dendrogram showing identified impediments to implementing FSP recommendations, where money = was money an impediment?; equipment = was equipment an impediment?; old = was age or ill health an impediment?; help = was it hard to find trained or skilled help?; people = was it difficult to find people who offer technical advice?; difficult = were the recommendations too difficult to understand?; impractical = were the recommendations impractical?; Y = yes; and N = no. Number in parentheses equals the number of respondents.



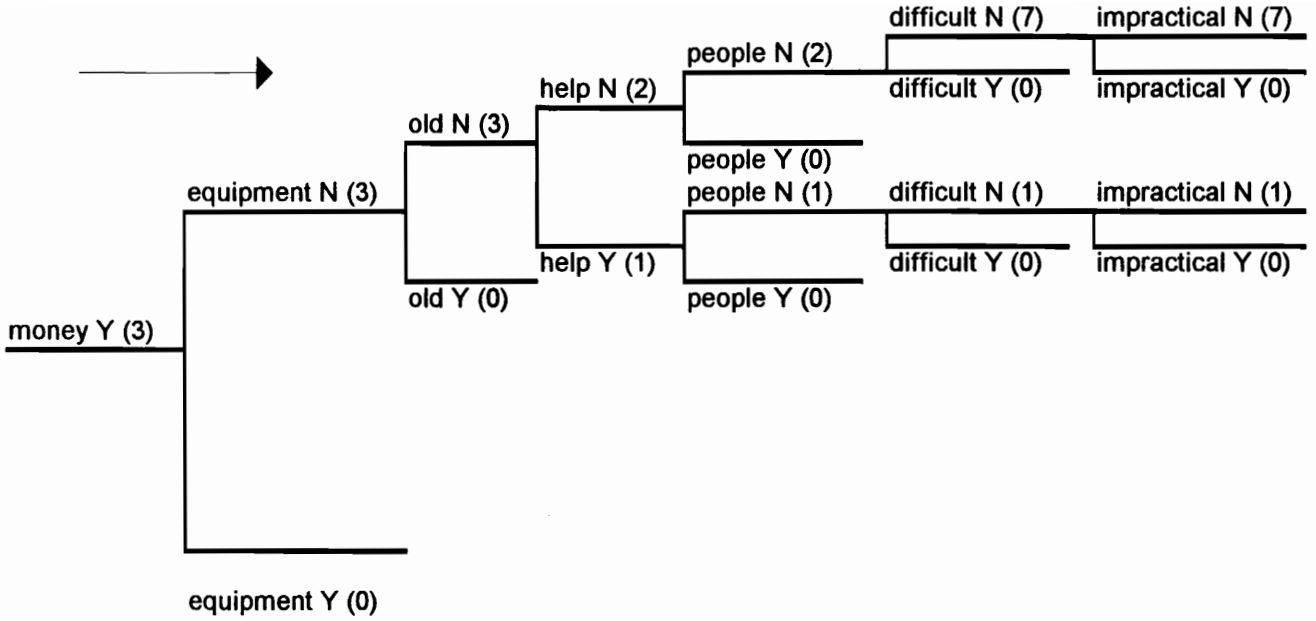
Appendix G.6. Dendrogram showing identified impediments to implementing FSP recommendations, where money = was money an impediment?; equipment = was equipment an impediment?; old = was age or ill health an impediment?; help = was it hard to find trained or skilled help?; people = was it difficult to find people who offer technical advice?; difficult = were the recommendations too difficult to understand?; impractical = were the recommendations impractical?; Y = yes; and N = no. Number in parentheses equals the number of respondents.



Appendix G.7. Dendrogram showing identified impediments to implementing FSP recommendations, where money = was money an impediment?; equipment = was equipment an impediment?; old = was age or ill health an impediment?; help = was it hard to find trained or skilled help?; people = was it difficult to find people who offer technical advice?; difficult = were the recommendations too difficult to understand?; impractical = were the recommendations impractical?; Y = yes; and N = no. Number in parentheses equals the number of respondents.



Appendix G.8. Dendrogram showing identified impediments to implementing FSP recommendations, where money = was money an impediment?; equipment = was equipment an impediment?; old = was age or ill health an impediment?; help = was it hard to find trained or skilled help?; people = was it difficult to find people who offer technical advice?; difficult = were the recommendations too difficult to understand?; impractical = were the recommendations impractical?; Y = yes; and N = no. Number in parentheses equals the number of respondents.



Appendix G.9. Dendrogram showing identified impediments to implementing FSP recommendations, where money = was money an impediment?; equipment = was equipment an impediment?; old = was age or ill health an impediment?; help = was it hard to find trained or skilled help?; people = was it difficult to find people who offer technical advice?; difficult = were the recommendations too difficult to understand?; impractical = were the recommendations impractical?; Y = yes; and N = no. Number in parentheses equals the number of respondents.

APPENDIX H

Comments from Virginia FSP Participants from 1991 - 1993

Communication

This is a program that seems like a great idea, yet when asked what the purpose is for it, I have difficulty articulating a response. Time (or lack thereof) is a huge factor in not getting things done, but motivation would help. Our area forester/forest stewardship Coordinator hasn't contacted us in a couple of years. Is the program dead?

Occasional or periodic follow-up to assist with advanced or refinement of objectives or expanding objectives.

It appears that the follow-up is lacking and I do not know who's fault that is. I want to know more!

As indicated in question #54, I have had little communication with anyone about stewardship since setting up the plan. I was advised that I would be hearing from the Department of Forestry, but never did, much to my dismay. I figured that the program was no longer active. I would sincerely like to continue with appropriate assistance.

Very good program, enjoy being a part of it. I was very impressed with the attention and consideration I have received from everyone involved.

Cost-sharing/SIP

I am in the process of spending a good deal of money in the hopes that the stewardship program helps with some of the costs. I feel your requirement to maintain a clover patch for 10 years is not practical. Clover has to be reseeded fertilized etc. Your initial cost sharing does not reflect this cost.

Financial incentives should not be given to landowners for improving their property. I believe those in the program can well afford the improvements that will benefit them.

Insufficient and inadequate cost-share funding available to assist with application of measures recommended. Cost of measure should be evaluated in conjunction with agencies who have expertise in related areas (such as [NRCS formerly] SCS). Estimate costs are too low and percent of cost-share should be increased.

Funding availability uncertain and vague. In fact we never received any funding.

When signing up for the VA FSP I was advised by VA State Forester that I could sign up for cost sharing for improvements on my property, such as building a road to the site for some of my objectives. As of this date I haven't heard from anyone about cost-sharing.

It is hard to obtain information on what financial help might be available to me through SIP. What stewardship practices are covered or qualify for SIP money?

The Forest Stewardship Program

The program has evolved to focus more on timber production than other land uses. Monies have been used to supplement agency budgets and personnel to detriment of cost-share to landowners.

My management objectives were for songbirds and salamanders. I found the slant of the FSP to be game wildlife, timber, and farming. Much of the plan was generated by me and included in their plan with a bunch of "farming" attitude ideas that I have ignored (related to maximizing profit for logging or agriculture).

I believe that the FSP is very good at educating and motivating people to improve, develop, and maintain their property. I would like to see it continue. I wish I had more time to work on my property, it is very rewarding.

Forms are much too complicated. Local forester needs help in administering this program. He has entirely too much responsibility in our area, and though no fault of his own, has been slow and difficult to coordinate with at times. Overall I am pleased with the results of the stewardship program and look forward to its continuance.

An excellent program/investment. I wish there were more VDOF and VDGIF people to go around.

VITA

Teresa Michelle Hudson was born to Robert Anton and Phyllis Murphy Hudson on November 15, 1970 in Augusta, Georgia. She graduated from Westside Comprehensive High School with honors in June 1988. After high school, she attended the University of Georgia in Athens, Georgia. Her summers were spent working in Georgia as an intern with Federal Paperboard, Inc. (Woodlands Division) and in Yellowstone National Park, Wyoming, while on a missions project. During her two final years in Athens she worked for the U.S. Forest Service Southeastern Forest Experiment Station. Teresa received her Bachelor of Science in Forest Resources from the University of Georgia in June 1993. In August 1993, she became a Master's Degree candidate in the Department of Fisheries and Wildlife Sciences at Virginia Polytechnic Institute and State University, Blacksburg, Virginia. She completed her degree requirements in October, 1995.