ASSESSING WEST VIRGINIA NIPF OWNER PREFERRED FOREST MANAGEMENT ASSISTANCE TOPICS AND DELIVERY METHODS

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ABSTRACT.—Four hundred and fourteen non-industrial private forest (NIPF) owners in West Virginia responded to a mail survey questionnaire assessing their forest management assistance topics and delivery methods of interest. Logistic regression was used to analyze 39 independent variables in relation to the dependent variables of wanting a specific topic of forestry assistance or not. Ownership of property for investment, cultivation of wildlife food crops, receiving assistance from the West Virginia State Division of Forestry, and ownership tenure were recurrent significant variables characterizing landowners wanting a specific assistance topic. These results can be used to develop forestry assistance programs that reflect landowner objectives and good forest management.

Forests cover nearly 80 percent of the West Virginia land base. The resources derived from those forests are vital for the economic, social, and ecological sustainability of the State and its residents. In 1995, forest-based activities such as timber harvesting, saw milling, and wood products manufacturing contributed $3.2 billion to the West Virginia economy. Nature based recreation and tourism contributed $1.5 billion to the States economic output in 1996 (Magill 2000). Individual benefits such as privacy of residence, freedom of ownership, and a sense of place are also derived from forest lands like those of West Virginia. Other social benefits provided by such forest land include un-priced forest recreational and subsistence uses, aesthetics, clean water, and fresh air (Flora 1992). More important, the benefits provided by forest resources are renewable over the long-term, if they are properly managed.

White (1993) reported that 83 percent of the forest land in West Virginia belonged to private landowners. According to Birch (1996), 76 percent of the 10,745,000 privately owned forest acres in the State belonged to non-industrial private forest (NIPF) owners. Given the large proportion of NIPF ownership (> 250,000) in the State, the concern is that less than 15 percent of these landowners are known to have received assistance in the last 10 years (Fraser and Magill 2000). Further heightening concerns to provide sufficient forestry assistance is the continued harvest of timber over the last decade using diameter limit cutting, especially on NIPF properties in West Virginia (Fajvan and others 1998). The problem is that diameter limit cutting, especially when repeated, can degrade the economic, social and ecological quality of these privately owned woodland resources.

The primary objective of this study was to determine what forest management topics NIPF landowners in West Virginia prefer and whether or not those preferences are influenced by their socioeconomic characteristics, their reasons for owning forest property as well as management activities conducted on their property, and sources of assistance received. A secondary objective was to determine whether landowners preferred one educational assistance delivery method to another.

METHODS

NIPF landowner information for the study was obtained during the winter of 1999-2000 using a stratified random sample (by region, forest cover, and acreage) and a seven-page mail survey questionnaire. Question categories included property size and ownership, forest land use

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Table 1.—*Independent landowner charactistics analyzed*

Demographics	Property uses	Forest activity	Agencies
Region	Residence	Harvest timber	WV University Forestry
Land size	Investment	Plant trees	WV University Extension
Tenure	Wildlife habitat	Thin trees	WV State Forestry
Income	Hunt or Fish	Cut vines	
Landowner age	Watershed	Visual resource	
Education level	Visual beauty	Build trails	
	Hike or Bike	Build roads	
	Produce timber	Wildlife food	
	Christmas trees	Soil resource	
	Fruit orchard	Water resource	
	Ginseng etc.	Ginseng, etc	
	Graze livestock	Survey property	
	Firewood /Posts	Forest protection	
	Maple syrup	Lease property	
	Other	Other (fencing)	

and management, assistance received, socioeconomic information, and assistance preferred. Questionnaires were sent to 1,080 forest owners using multiple mailings based on the Dillman Method: first mailing, follow-up postcard, and then second mailing to increase response rate (Dillman 1978).

Logistic regression (logit) models were used to narrow down and identify the most significant group of explanatory landowner attributes that differentiate those interested in a specific assistance topic. The dependent variables examined for analysis were chosen from the assistance topics included in the survey questionnaire. Nine of the fifteen assistance topics surveyed were analyzed using logistic regression and were chosen based on the number (≥ 40 percent of 414) of owners (≥ 166) requesting each topic of assistance. The number of assistance topics was narrowed to nine for logistic analysis in order to concentrate on the most requested types of management aid.

Logistic regression was performed separately for each of the topics analyzed using 39 independent landowner variables and the dependent variable (binary Yes = 1 or No = 0) of wanting a certain topic or not. The explanatory (independent) variables included 6 demographics, 15 property-uses, 15 management activities, and 3 agencies (table 1).

The significant independent variables were then retested against each other separately by topic to provide the most parsimonious set of explanatory factors that describe landowners wanting a certain topic of assistance. All statistical significance levels were set at alpha ≤ 0.10. Backward elimination was used to select independent variables by significance of p-values (≤ 0.10) in the model building process. Explanatory (independent) variable p-values were used to test the null hypothesis (H_o: $b_i = 0$) that selection of a specific forestry assistance topic was independent of all landowner characteristics. Descriptive statistics were computed to highlight differences in educational delivery mechanisms preferred by landowners wanting a specific assistance topic.

RESULTS

The sample response of 414 landowners proved to be representative across the State, which was demonstrated by the lack of significance ($Chi^2 = 1.91$, $p = 0.72$) between the number who responded and the number expected to respond according to the sample stratification.

The most sought after assistance topic was forest damage prevention (e.g., by fire, insects, disease, deer, etc.) followed by water resources, silviculture, wildlife management, landowner liability, property rights and taxes, soil resources, aesthetic improvement, dendrology and silvics, valuation of timber or forest land (fig. 1).

Chi^2 values for all nine logistic regression models did not change significantly with the reduction in explanatory independent variables, making the models with less significant (independent) factors parsimonious for identifying respondents wanting a specific topic. This means that fewer characteristics (average of 5) were needed at the alpha ≤ 0.10-level to identify landowners interested in each assistance topic.

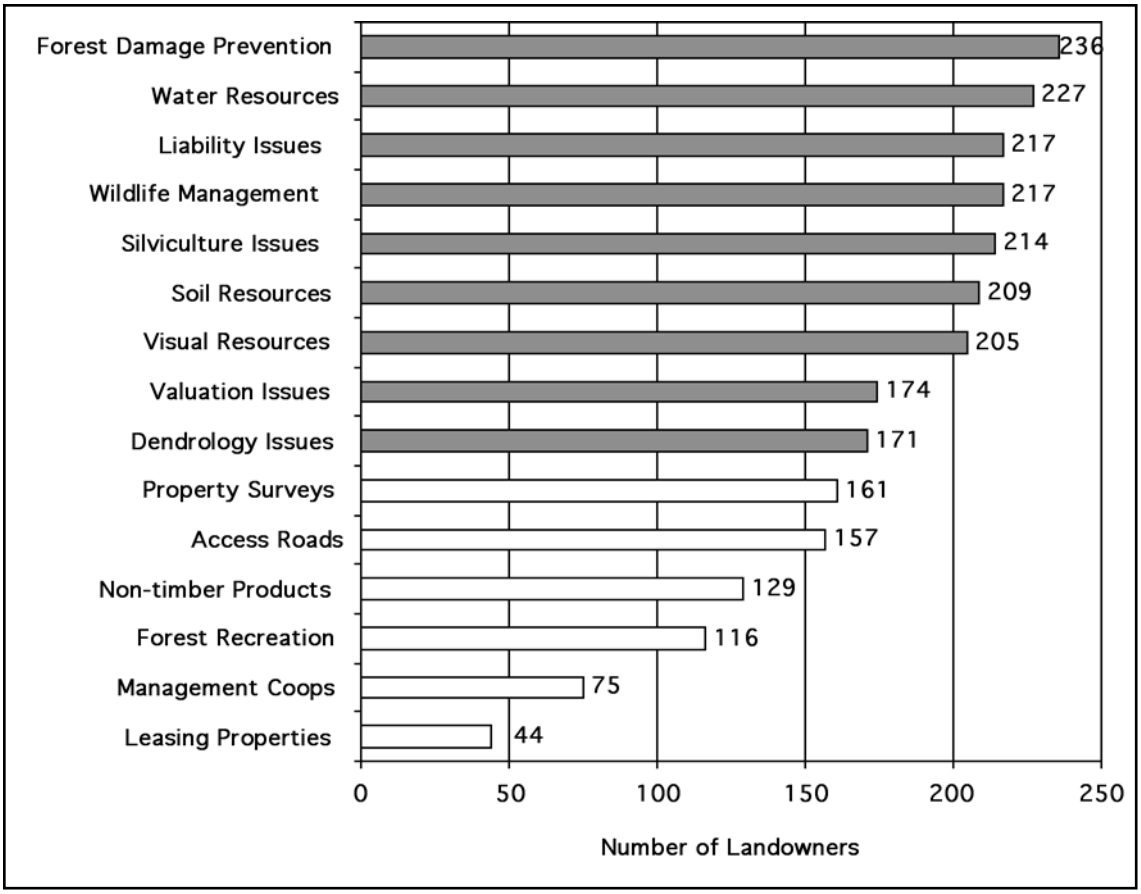

Figure 1.—*Assistance topics preferred by respondents (gray bars = topics analyzed).*

The results from the parsimonious models formed the basis for statistical conclusion and discussion in this paper.

The models, on average, accurately identified 70 percent interested and 64 percent of those not interested, respectively, in the topics. The odds-ratio on average was 5:1 meaning that landowners were 5 times more likely on average to request one of these nine topics when characterized by the significant explanatory variables (table 2). Negative signs accompanying p-values indicate a negative relationship between that variable and the topic of interest. In this analysis the negative relationships mean a smaller land-size, less tenure, and younger landowner age.

Logistic Regression Results

Results from logistic regression analysis models revealed similarities and differences between landowners regarding their preference for different assistance topics. The models linked these preferences with landowner reasons for owning forest property, forestry practices conducted, assisting agencies, and socioeconomic characteristics. Ownership of property for investment, cultivation of wildlife food crops, length of ownership, and receiving assistance from the West Virginia State Division of Forestry were recurrent significant factors characterizing landowners interested in the nine topics analyzed (table 2).

Investment was an inherent attribute of forest ownership for landowners interested in forest damage prevention, wildlife management, silviculture, forest resource valuation, dendrology, and liability issues. NIPF owners in Louisiana also indicated investment as an important ownership objective (Lorenzo and Beard 1996). Respondents requesting assistance for wildlife and visual resource management, soil fertility, and erosion issues as well as for plant identification were more likely to plant wildlife food crops. Landowners requesting wildlife management assistance also tend to own their forest property for wildlife habitat and a place to live. Studies in Kentucky (Gracey and Pelkki 1996), Indiana (Mills and others 1996), and Louisiana (Lorenzo and Beard 1996) likewise indicated that NIPF owners in those states tend to have wildlife ownership and/or management objectives.

Table 2.—*Logistic regression significant p-values and odds ratio by assistance topic*

Characteristics	Forest damage prevent	Water resource	Liability issues	Wildlife Manage.	Silvi-culture issues	Soil resource	Visual issues	Valu-ation issues	Dendro-logical issues
Odds ratio	4 to 1	4 to 1	4 to 1	6 to 1	6 to 1	3 to 1	3 to 1	5 to 1	4 to 1
Demographics									
Land size		0.04 (-)							
Tenure			<0.001 (-)	<0.001 (-)					<0.001 (-)
Income		<0.001		0.02					
Landowner age						<0.001 (-)			
Property uses									
Residence				0.02					
Investment	<0.001		0.02	0.02	0.01			0.01	<0.001
Wildlife habitat				<0.001					
Visual beauty					<0.001		<0.001		
Produce timber	<0.001							<0.001	
Ginseng etc.			0.04						
Graze livestock		<0.001				<0.001			
Forest activity									
Cut vines								0.04	
Build trails				<0.001					
Wildlife food				0.01		0.02	0.09		0.01
Ginseng, etc.		0.01			0.02				
Forest protection	<0.001		<0.001				0.03		
Other (fencing)					<0.001	0.03		<0.001	
Agencies									
WV State Forestry	<0.001	<0.001	<0.001		<0.001	0.01	<0.001	<0.001	

Owning forest property for a shorter period of time (1 to 10 years) was characteristic of landowners wanting aid to deal with liability, wildlife, and plant identification issues. Landowners earning higher annual incomes (> $40,000) were more inclined to request wildlife management and water resource assistance (table 2). This was comparable to an Indiana study in which NIPF owners participating in government forestry assistance programs were found to have higher incomes and own forest property for less years than did non-participants (Mills and others 1996). Receiving assistance from the West Virginia State Division of Forestry was an attribute characteristic of respondents interested in seven of the nine topics tested. NIPF owners in Kentucky also indicated state forestry agencies as a more relevant means to obtain management assistance (Gracey and Pelkki 1996).

Production of timber and visual forest enjoyment were the second most significant forest ownership reasons for landowners interested in the topics analyzed. Timber production was a differentiating ownership characteristic of landowners requesting forest damage prevention and valuation assistance. Cultivation of timber resources was likewise a distinct property use for NIPF owners belonging to the Kentucky Woodland Owners Association (Gracey and Pelkki 1996). Maintaining visual resources was a distinct ownership objective for West Virginia respondents interested in visual resources and silvicultural issues (table 2). NIPF owner's interested in silviculture aid were more inclined to grow and harvest non-timber products (ginseng, etc.), as were those with water resource and liability concerns.

Implementation of forest damage prevention and fence-building practices followed wildlife food plantings as the most common significant management activities conducted by landowners requesting the nine topics (table 2). Protecting forest resources was a distinguishing management practice implemented by landowners having forest damage prevention, visual resource, and ownership liability concerns. A

study in Indiana concluded that NIPF owners participating in government programs tend to request forest damage prevention assistance (Mills and others 1996). Constructing fence to protect forest resources was a significant management activity for landowners interested in silviculture practices, soil resources, and valuation issues.

Livestock pasturage was a distinctive property use for landowners interested in both water and soil resource issues (table 2). A Kentucky study likewise revealed farming to be an important ownership reason for the NIPF population in that state (Gracey and Pelkki 1996). Building access trails and cutting vines were significant management activities for only the landowners wanting wildlife management and valuation assistance, respectively.

Preferred Educational Delivery

With regards to delivery mechanisms, workshops were most requested by landowners (63 percent) wanting to address liability concerns followed by those wanting to address visual resource management, plant identification, wildlife management, timber and forest land valuation, forest damage prevention, and silviculture issues (table 3). Financial management aid was the most sought after by respondents wanting water (68 percent) and soil (65 percent) management assistance followed by landowners seeking assistance for wildlife management, silviculture, and forest damage prevention. Technical assistance services were of the most interest for landowners wanting to obtain water management (74 percent) and forest damage prevention (70 percent) aid followed by respondents wanting aid to address soil resource, silviculture, wildlife management, valuation, and liability concerns.

DISCUSSION AND IMPLICATIONS

The response to this survey by NIPF landowners was enthusiastic and revealed interest in a wide range of forestry assistance topics. Results indicate that this population of NIPF landowners interested in obtaining help is varied, because selection of a topic in this analysis was more dependent on reasons of forest ownership and management activities conducted than on the socioeconomic characteristics of the landowner. The landowners that participated in this survey see their forest property as an investment for varied reasons.

There is a high level of interest in wildlife management, which concurs with the results of NIPF studies in other states. Timber production and visual forest enjoyment, which were revealed as common attributes of ownership in this study, solidify landowner interest in varied forest resource use and management. Implementation of forest protection practices were also among the most influential management activities indicated in relation to selecting a topic of assistance and further illustrate investment as an important reason of forest ownership.

Forest damage prevention was the most requested assistance topic, which further substantiates the concern of this landowner group to protect their forest investment. Methods of educational and assistance delivery preferred by respondents were likewise diverse, but the highest proportion of requests were for technical aid (table 2).

Previously obtaining assistance from the West Virginia State Division of Forestry was likewise an influencing factor for a respondent selecting one of the nine topics included in this survey. Perhaps landowners used this state agency for

Table 3.—*Preferred delivery mechanism percentages by assistance topic*

		Preferred delivery mechanism		
Assistance topics	**Requests**	**Workshop**	**Financial**	**Technical**
Forest damage prevention	236	50%	51%	70%
Water resources	227	44%	68%	74%
Liability issues	217	63%	27%	59%
Wildlife management	217	54%	57%	67%
Silviculture issues	214	49%	57%	70%
Soil resources	209	44%	65%	71%
Visual issues	205	60%	47%	61%
Valuation issues	174	52%	33%	79%
Dendro issues	171	59%	51%	65%

previously obtaining assistance, because it is more visible and available. State forestry agencies were also indicated by a Kentucky study of NIPF owners as a more relevant source of assistance. This same study confirmed that landowners belonging to the Kentucky Woodland Owners Association were more actively involved in managing their forest properties (Gracey and Pelkki 1996). Getting more West Virginia landowners to join forestry organizations may improve their participation in forestry assistance programs, which in turn would help landowners to better understand and actively implement good management practices.

Forestry assistance and information programs in West Virginia should focus on enabling landowners to meet their ownership and management objectives. These programs should additionally focus on fostering more landowners who are better informed about and who implement good forest management practices. Assistance topics provided should cover a diverse array of forest management activities in order to involve a wider landowner audience. Utilizing a variety of methods and programs for engaging all NIPF owners could further result in better management of forest resources in West Virginia. In addition to involving more landowners in organizations like the Woodland Owners Association, these program focuses used in combination should likewise help to improve landowner participation (table 2). The computer internet is another mode of information delivery not analyzed in this study that could prove highly useful for increasing forest landowner participation in management and assistance programs.

Kluender and Walkingstick (2000) suggest that concentrating landowner education on a variety of ownership and management objectives would foster a better relationship between resource professionals, forest industry, and environmentally concerned landowners while likewise making forest owners more likely to manage their resources. Results from this survey could be used to develop forestry assistance and information programs in West Virginia that reflect the objectives of these landowners as well as good forest management.

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