Appendix

Land Managers, & Forest Products Operators

Pennsylvania State University, *Landowner Perspectives on Timber Harvesting*

Landowner's Perspectives on Forest Management in Allegany County, Maryland

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INTRODUCTION

This study advances current knowledge about Allegany County private forest landowners (PFLs), their characteristics, attitudes toward forest management, and harvesting behavior. Understanding these factors permits state and county forest managers to design stewardship and education programs to meet PFL needs. Such programs better enable forest management agencies to target resources and policies promoting sustainable forestry, especially in areas undergoing extensive forest parcelization. Lessons learned here could have important applications elsewhere in Maryland and other northeastern states characterized by high percentages of small woodlot PFLs.

In response to the increased parcelization of woodlots in Allegany County, the Maryland Department of Natural Resources' (MDNR) Forest Service established the Working Woodlot Initiative (WWI) Pilot Project in 2005. WWI is designed to promote forest management on woodlots of less than 10 acres and seeks to advance the development of small-scale timber harvesting[1] techniques as a forest management strategy. Because forestland in the County is divided into small parcels, small-scale harvesting is logically more suitable than large-scale operations using similarly large equipment. Small-scale timber harvesting minimizes damage to land, maintains the woodlot aesthetics, and is less costly to implement.

The four main objectives of WWI are to: (1) provide economic and production data on operating small equipment that assists PFLs in adding small-scale harvesting to their management portfolio; (2) determine marketing and merchandizing options accessible to low-volume harvests to improve profitability of operations; (3) assess demand for small-scale harvesting by quantifying the extent of small tract acreage and likely volume available for removal; and (4) survey PFLs about their acceptance of small-scale harvesting.

The Research Problem

Increasing exurban migration to rural areas in the northeastern United States threatens much of the forestland across the region. As more Americans search for residence in the natural areas and forestland beyond city limits, they jeopardize the natural resources where they seek refuge (Brennan et al., 2005; Egan, 2005; Egan and Luloff, 2000). Continual residential development in forested rural areas leads to parcelization and subsequent fragmentation of forestland (Egan and Luloff, 2000; Sampson and DeCoster, 2000). The greater the forest parcelization in a region, the greater the number of individual forest landowners. As a result of increased private ownerships of smaller size forest parcels, forest management challenges emerge (Birch, 1996; DeCoster, 1998; Sampson and DeCoster, 2000).

[1] Small-scale timber harvesting involves harvesting on small tracts of land with equipment that is easier to move between sites and less costly to operate than commonly used logging equipment. Smaller equipment and techniques minimize site disturbance, including soil erosion, and damage to residual trees. Equipment used in small-scale harvesting might include specially equipped small agricultural tractors, four-wheeler-ATV type machines, cable harvesting systems, and, in some cases, horse logging.

Urban migration to rural areas threatens contiguous forestland. Seeking solitude and escape, exurban migrants often establish residential developments close to or within forested areas. As a result, forestland is parceled or subdivided into small plots during land transfer. Parcelization reflects the reduction in size of fore stland tracts and increase in number of ownerships which result from the division of properties during land transfer (Luloff, Finley, and Melbye, 2000; Zhang and Zhang, 2004). As land holdings shift from one owner to another, forestland is further divided into smaller parcels, resulting in forest parcelization. When forestland is divided, large forest tracts often become fragmented reflecting distinct changes in landscape, land-use patterns, and land-use management (Egan and Luloff, 2005).

Fragmentation refers to the breaking-up of large tracts of contiguous forestland into smaller pieces where human activity (e.g., roads, house pads, cutting and clearing) create patches within the landscape. These patches or fragments may contain forest, open lawn, early successional cover. Sometimes, these patches create useful habitat diversity, but too often they are at scales that threaten wildlife habitat. Once connected forest tracts that served as habitats for deer, bear, and other wildlife, become disjointed islands of woodlots (Luloff, Finley, and Melbye, 2000). Forest fragmentation disrupts numerous ecosystems linked to forests, including plant and animal biodiversity, wildlife habitat, and watersheds.

Forests cover approximately 41% of the State of Maryland, or about 2.6 million acres (Widmann, 2005). About 76% (1.8 million acres) of this forestland is privately owned by 130,600 individuals (Frieswyck, 2001; MDNR Forest Service, 2005). Moreover, 75% of these PFLs own tracts less than 10 acres; average tract size is 17 acres (MDNR Forest Service, 2005). Widespread forest parcelization in Maryland introduces new challenges for forest managers especially in Allegany County where over half of the forestland there, approximately 63% (110,200 acres), is privately-owned and divided into small parcels of woodlots (Frieswyck, 2001).

As most of the forestland in Allegany County is held in private ownership, forest managers need to develop techniques which reflect the needs and perspectives of PFLs. In order to create management programs reflecting the PFL objectives, it is essential to identify and understand factors influencing their perspectives about forest management. Without the incorporation of PFLs' opinions, values, and beliefs about forest management, the future of Allegany County's forests could be bleak. This is especially the case since Allegany County is the most heavily forested county (78% forested) in Maryland (Widmann, 2005).

METHODOLOGY

In general, our understanding of PFLs is limited. This is especially true for Maryland's PFLs since the last statewide landowner survey was conducted in 1980 (see Kingsley and Birch, 1980). Numerous national and state studies describe PFL characteristics (cf. Birch, 1996; Butler and Leatherberry, 2004), attitudes (cf. Bourke and Luloff, 1994; Luloff et al., 1993), and harvesting behavior (Bliss et al., 1997; Kluender and Walkingstick, 2000). However, few studies explore Maryland PFL characteristics and attitudes about forest

management. While this study focused on PFLs in Allegany County, its methodology could be used in other areas of Maryland to assess PFL management perspectives.

Site Selection

The fourth objective of the WWI Project focused on the use of a household mail survey to gather individual measures of PFL perceptions of harvesting and forest management in Allegany County. Using this survey we collected quantitative information on PFLs' fore stland, ownership characteristics, forest values and attitudes, forest uses including harvesting and management experience, satisfaction with harvesting outcome, attitudes toward harvesting, harvesting intentions, and individual sociodemographic characteristics. The data drawn from the mail survey provided statistical evidence as to which factors had the strongest association with PFLs' intentions to harvest timber on their land.

Allegany County, Maryland

Located in western Maryland along the southern border of Pennsylvania, Allegany County is a region of farmland, forests, rolling hills, and valleys. The county has 211,400 acres of forestland, 63% of which is owned by PFLs. Allegany County is the most heavily forested county in the state; over three-quarters (78%) is covered by forests (Irland, 2004; Widmann, 2005). Since incorporation in 1789, the County has a long history rooted in the mining and extractive industries (Stegmaier, Jr., et al., 1976). Prior to the Civil War, agriculture and tobacco farming were prominent; however, with the expansion of trade and transportation in the 1 800s, coal mining and glassworks became the dominant industries in the region (Stegmaier, Jr. et al., 1976). The vast timber resources of Allegany County, mostly dense pine and hemlock, also contributed to the region's early economic development (Wiseman, 1976).

Population Characteristics

Residents of Allegany County are similar to most rural Marylanders (older, below state average levels of income and education – except for high school graduates), see Table 1. According to the 2000 Census, the population of the 425 square mile county was 74,930. This translates to a population density of 176 person per square mile compared to 542 for of the state. While the percentage of college graduates and graduate or professional degree holders is lower than the state average, the proportion of high school graduates is much higher. Substantial variation between Allegany County and state averages were identified in the 2000 economic indicators. Per capita and household incomes were well below the state average. Also, unemployment and poverty rates are higher in Allegany County than the state as a whole. Almost twenty percent of the workforce in the county is employed in the service sector whereas manufacturing employment accounts for only thirteen percent; both percentages exceeded state averages (19.2% versus 13.9% and 12.7% versus 7.3% respectively). However, a large proportion (over 40%) of the

Table 1 - Sociodemographic Characteristics of the Study Site and State of Maryland

	Allegany County	Maryland
Population	74,930	5,296,486
Area in square miles	425	9,774
Persons per square mile	176.3	541.9
Median age	39.1	36.0
% Under 20	24.1	28.2
% 65 and over	17.9	11.3
% Female	50.2	51.7
% over 25 High School Graduates	42.4	26.7
% over 25 College Graduates	7.6	18.0
% over 25 Graduate/Professional Degrees	6.5	13.5
Per Capita Income	$16,780	$25, 614
Median Household Income	$30,821	$52,868
% of Workforce Unemployed	4.8	3.2
% of Individuals in Poverty	14.8	8.5
% of Families in Poverty	9.7	6.1
% of Housing Units Vacant	11.1	7.7
% Employed in Farming, Forestry, or Fishing	0.3	0.3
% Employed in Construction	10.3	8.6
% Employed in Service Occupations	19.2	13.9
% Employed in Manufacturing	12.7	7.3
% Forest Products Employment as Percentage of Manufacturing	43.3[1]	8.1

Data Source: U.S. Census, 2000

[1] Maryland Department of Labor, Licensing and Regulation, in Irland, 2004

manufacturing employment in Allegany County, is in the forest products industry; this is substantially higher than the state average. Less than one percent of the county workforce is employed in farming, fishing, or forestry, but this is similar to the state average.

Household Mail Survey

A modified Tailored Design Method was used in the survey (Dillman, 2000). This method stressed precise methodology, including specialized design and personalization so as to increase response rates. The PFL mail survey was designed to measure the following major areas of interest: (1) general information about the respondent's property and forestland characteristics; (2) ownership characteristics; (3) values and attitudes about the treatment, care, and responsibility for the forest; (4) harvesting behavior,

outcome, incentives, and intentions; (5) attitudes about harvesting and management; (6) general information about forest products and harvesting equipment; and (7) personal characteristics of the respondent. An example of the survey instrument is included in Appendix A.

Survey Sampling

The sampling frame for the mail survey was drawn from Maryland's Department of Taxation and Assessment Real Property Data Search database and the list of Forest Stewardship Program (FSP) participants recorded by Maryland DNR Forest Service. The Real Property database is a collection of tax assessment data on all landowners in the state. Since residents are easily identified by acreage of fore stland in the database, it was chosen as the most complete sampling frame. Individual landowners owning five or more forested acres were identified from the Real Property database (N=251) and the FSP database (N=149). A decision was made to randomly sample landowners who owned 5 or more acres of forestland in Allegany County; a total of 400 households were identified for participation in this study.

Since the database is not updated regularly, property turnover was an issue. Therefore, if the initial contact letter was returned undeliverable, that landowner was removed from the sample. Despite this limitation, using tax assessment records to identify PFLs has been a preferred sampling method in past studies (cf., Kendra and Hull, 2005; Kluender and Walkingstick, 2000).

In order to obtain a more representative sample of female PFLs, cover letters were addressed to alternating male and female PFLs (if the property was co-owned). A pre-test of the mail survey with PFLs in Centre County, Pennsylvania, was conducted in late June, 2006. Respondents were asked to complete the questionnaire and provide feedback about any problems they identified in the questionnaire including definitional issues, awkward phrasing, and/or unclear questions. Changes were made based on this feedback.

Survey Administration

Each survey was personalized, including a cover letter signed by the principal investigator, "live" postage, and a pre-addressed return envelope (Dillman, 2000). The survey was administered from July through September 2006. An initial mailing of a pre-notice letter was sent to respondents informing them a questionnaire for an important survey about private forestland and timber harvesting would arrive in a week and their participation would be greatly appreciated. This was followed by the mailing of the survey, return envelope, and cover letter. Ten days later, a thank you/reminder postcard was sent to all landowners. After two weeks, a second modified letter and survey was sent to non-respondents. After an additional three weeks, a third modified reminder letter was sent to non-respondents on behalf of the MDNR Forest Service. Finally, after three additional weeks, a modified letter and third and final survey instrument was sent to the remaining non-respondents. Following these efforts over three months, unreturned surveys were considered non-responses.

Overall, a response rate of 51.3% with the mail survey was achieved (Table 2). In total, we received responses from 202 PFL households. The adjusted sample size was 394. Adjustments were made for undeliverable surveys or those sent to ineligible respondents (those who did not own fore stland or moved away).

Table 2 - Response Rates

Returned	202
Not returned	192
Undeliverable	6
Total	400
Not excluding undeliverable	50.5%
Excluding undeliverable	51.3%

ANAL YSIS OF DATA

The data obtained through the mail survey was used to analyze relationships between PFL attitudes toward, and perceptions of, forest management, timber harvesting, and small-scale timber harvesting. In this study, both bivariate and multivariate analytic techniques were used. Data gathered from the mail survey were used to address the original research question – what factors are related to PFL perspectives on forest management, timber harvesting, and small-scale timber harvesting?

Bivari ate Analysis

The data analysis began with a review of responses, a validation of sample responses, and an exploration of differences in responses by various sociodemographic characteristics. A description of all responses to all survey items is included in Appendix B.

Sociodemographic Profile

Several sociodemographic variables were used to describe the population of mail survey respondents. Table 3 presents the sociodemographic characteristics for the aggregate dataset (N=202). Where possible, results are compared with equivalent indicators from the US Census for Allegany County.

The survey population was older (57 years versus 39 years) and more male (75% versus 50%) than the county population. Although the percentage of female survey respondents was much lower than the county population, the proportion of female respondents (25%) was much higher when compared to other PFL studies. This most likely reflects the sampling methods implemented since an attempt was made to obtain equal representation of male/female PFLs. However, most female respondents indicated in the comments section of the survey that they gave the survey to their husbands because they knew more about their forestland.

Table 3 - Sociodemographic Characteristics of Respondents

Indicator	Mean	Survey %	Census[1] %	Standard Deviation	Range Min	Range Max
Age (n = 190)	56.58		39.10	13.44	26	90
20-29		1.6				
30-39		11.1				
40-49		16.9				
50-59		30.5				
60-69		20.5				
70-79		15.3				
80-89		3.7				
90+		0.5				
Gender (n = 192)						
Female		25.5	50.2			
Male		74.5	49.8			
Residence (n = 195)				1.50	1	6
Large city		2.1				
Suburban area outside large city		11.8				
Small city		6.2				
Suburban area outside small city		18.5				
Town or village in rural area		12.8				
Countryside in rural area		48.7				
Education (n = 192)				1.56	1	6
Less than a high school degree		2.1	20.1			
High school degree or GED		22.9	42.4			
Some college		20.8	16.5			
2-year technical or associates degree		14.1	6.9			
4-year college degree		16.1	7.6			
Advanced degree		24.0	6.5			
Employment (n = 193)				1.20	1	6
Full time		54.4	50.8[2]			
Part time		4.1				
Retired		36.8				
Student		0.0				
Homemaker		3.1				
Non-employed		1.6	4.8			
Income (n = 156)			30,821	1.79	1	7
Less than $15,000		4.5	24.1			
$15,000 to $24,999		5.8	17.2			
$25,000 to $34,999		12.2	14.7			
$35,000 to $49,999		11.5	16.8			
$50,000 to $74,999		21.8	17.0			
$75,000 to $99,999		14.7	5.9			
$100,000 or more		29.5	4.2			
Years owned forestland (n = 184)	18.60			13.31	0	64
Forestland part of residence (n = 193)	0.56	56.0		0.50	0	1

1 Allegany County statistics were obtained from the 2000 US Census.
2 This figure represents the percentage of the total county population employed full and part time in 2000.

The typical respondent had higher income ($100,000 or more) and education levels (advanced degree) when compared with the county population. More were employed (full and part time; 5 8.5%) when compared to the county population (50.8%). Also, the county population reported a higher unemployment rate than the survey population (4.8% versus 1.6%).

However, there were fewer high school graduates or individuals with less (23%) than in the county population (42%). Most (49%) respondents lived in the countryside in a rural area, were employed full time (54%), and over two-thirds (37%) were retired; only 4.1% were employed part time. Approximately nine percent of respondents were not in the labor force (i.e., homemakers or non-employed). In examining ownership characteristics, PFLs owned their forestland for an average of nineteen years and over half (56%) resided on their forestland.

PFL Perspectives on Timber Harvesting

Data was gathered on numerous independent variables to assess landowners' perspectives on timber harvesting and small-scale timber harvesting. The following section presents the frequency distribution of key items on harvesting experience, small-scale harvesting, and the sociodemographic differences of respondents' who harvested and used small-scale harvesting techniques.

The typical respondent owned 72 forested acres in their largest parcel of land. About 48% percent of respondents in this sample harvested timber from their land during the last ten years. The frequency distribution for forested acres and timber harvesting can be found in Appendix B.

Cros stabs analysis was used to determine forest parcel size of PFLs who harvested (see Table 4). Of those PFLs who harvested timber from their land in the last ten years, the majority (4 8%) owned between one to twenty-four acres of forestland, followed by those who owned 100 or more forested acres (22%), and those who owned between twenty-five to ninety-nine acres (17%); landowners who owned between fifty to ninety-nine forested acres were the least likely to have prior harvesting experience (13%).

Table 4 - Frequency of forested acres with harvesting experience

Forested acres	Harvested	
	Yes	No
1-24	47.8%	51.5%
25-49	17.4%	16.8%
50-99	13.0%	13.9%
100 and up	21.7%	17.8%
Chi-square	0.54	

Most (55%) PFLs who harvested timber were happy with the outcome of the harvesting that took place on their land in the last ten years (see Table 5). A little over thirty percent (30.2%) of PFLs were very happy with harvesting outcomes while very few were unhappy or very unhappy with their harvesting experience (1.2% and 4.7% respectively).

Table 5 - Frequency of PFL happiness with harvesting outcomes

Happiness	Harvested	
	Yes	No
Very unhappy	4.7%	16.7%
Unhappy	1.2%	0.0%
Neither	9.3%	0.0%
Happy	54.7%	50.0%
Very happy	30.2%	33.3%
Chi-square	0.54	

Several independent variables were used to examine PFL characteristics and perceptions about small-scale timber harvesting. In this sample, almost one in four PFLs (23.1%) used small-scale harvesting techniques on their land during the last ten years (see Table 6).

Table 6 – Frequency of PFL use of small-scale harvesting techniques

Yes	23.1%
No	76.9%

Half (5 0%) of the PFLs in the survey population indicated they only used small-scale harvesting techniques once in the past ten years (Table 7). Over ten percent (11.4%) indicated they practiced small-scale harvesting on their land ten times in the last ten years.

Table 7 – Number of times PFLs used small-scale harvesting techniques

0	9.1%
1	50.0%
2	9.1%
3	4.5%
4	4.5%
5	4.5%
6	4.5%
10	11.4%
26	2.3%

Some of the factors that led PFLs to use small-scale harvesting included achieving objectives in their management plan (13.9%), to improve growing conditions for seedlings (13.9%), needed wood for personal use (12.4%), and to salvage damaged trees (10.9%), see Table 8. Over a quarter (27.3%) of PFLs said the most important factor in deciding to use small-scale harvesting techniques was to achieve objectives in their management plan (27.3%; Table 9). This was followed by improving growing conditions for remaining trees (18.2%) and needed wood for personal use (11.4%).

Table 8 – Factors that led to PFL decision to use small-scale harvesting techniques

A. Approached by a buyer	1 .0%
B. To achieve objectives in my management plan	13 .9%
C. Trees were mature	9 .4%
D. Needed the money	2 .5%
E. Needed wood for my own use	12 .4%
F. Price was right	1 .0%
G. To build a road	4 .0%
H. To clear land for building	3 .5%
I. To improve hunting opportunities	7 .4%
J. To improve scenic quality	5 .0%
K. To improve recreation opportunities	2 .0%
L. To salvage damaged trees	10 .9%
M. To improve growing conditions for remaining trees	13 .9%
N. To allow seedlings to grow	7 .9%
O. To improve wildlife habitat	10 .4%
P. Other	3 .5%

Table 9 – Most important factor that led PFLs to practice small-sc ale harvesting techniques

A. Approached by a buyer	0.0%
B. To achieve objectives in my management plan	27.3%
C. Trees were mature	6.8%
D. Needed the money	0.0%
E. Needed wood for my own use	11.4%
F. Price was right	0.0%
G. To build a road	2.3%
H. To clear land for building	2.3%
I. To improve hunting opportunities	6.8%
J. To improve scenic quality	4.5%
K. To improve recreation opportunities	0.0%
L. To salvage damaged trees	6.8%
M. To improve growing conditions for remaining trees	18.2%
N. To allow seedlings to grow	0.0%
O. To improve wildlife habitat	4.5%
P. Other	9.1%

About sixteen percent (15.8%) of PFLs managed the harvest themselves whereas a little over 12 percent (12.4%) received advice from a MD DNR Forest Service forester (see Table 10). Four percent sold the timber directly to a timber company, while almost four percent (3.5%) either got advice from a consulting forester or sold the timber directly to a logger.

Table 10 – How PFL small-scale harvests were managed

A. Hired a consulting forester	1.0%
B. Got advice from a consulting forester	3.5%
C. Got advice from an industry forester	0.5%
D. Got advice from a MD DNR Forest Service forester	12.4%
E. Managed the harvest myself	15.8%
F. Sold the timber directly to a logger	3.5%
G. Sold the timber directly to a timber company	4.0%
H. Other	1.0%

While very few (15.5%) PFLs are opposed to small-scale harvesting techniques, almost a third (30.2%) stated that they were uninterested in harvesting timber (see Tables 11 and 12). Other reasons for not using small-scale harvesting techniques included aesthetic

issues (20.8%), concern about doing damage to property (16.8%), concern about hunting opportunities being reduced (12.9%), and concern about harvesting impacts (12.9%).

Table 11 – PFLs opposed to small-scale harvesting

Yes	15.5%
No	84.5%

Table 12 – Why PFLs have not used small-scale harvesting techniques

A. I'm opposed to cutting trees in general	8.9%
B. Just not interested in harvesting timber	30.2%
C. Couldn't find a logger to do small-scale harvesting	4.5%
D. Property is too small	11.4%
E. Hunting opportunities would be reduced	12.9%
F. Recreational opportunities would be reduced	8.9%
G. No market for timber or other forest products	1.0%
H. Local ordinances	0.5%
I. Harvest would deplete other non-timber values	4.0%
J. Aesthetic issues	20.8%
K. Concerned about harvesting impacts	12.9%
L. Concerned about affecting neighbors	1.0%
M. Concerned about doing damage to my property	16.8%
N. Don't trust loggers	9.9%
O. Don't trust foresters	1.0%
P. Don't trust the forest industry	2.0%
Q. Access too limited to woodlot	3.5%
R. Land is too steep	9.4%
S. Can't find someone to do the harvest	4.0%
T. Don't know how to manage a harvest	4.0%
U. I don't know anything about small-scale harvesting	10.9%
V. Other	19.3%

Almost a quarter of PFLs (24.8%) indicated they did not use small-scale harvesting techniques because they were not interested in harvesting timber while a little over twenty percent (21.8%) gave other reasons (see Table 13). About eight percent (8.3%) of PFLs indicated they did not know anything about small-scale harvesting techniques. In fact, very few PFLs had attended a meeting about or went to a demonstration of small-scale timber harvesting (9.3% and 5.7% respectively), see Table 14. However, over forty percent (42.6%) of PFLs had read something about small-scale harvesting techniques and almost a quarter (24.4%) knew someone who was using them.

Table 13 – Main reason why PFLs have not used small-scale harvesting techniques

A. I'm opposed to cutting trees in general	6.8%
B. Just not interested in harvesting timber	24.8%
C. Couldn't find a logger to do small-scale harvesting	2.3%
D. Property is too small	5.3%
E. Hunting opportunities would be reduced	5.3%
F. Recreational opportunities would be reduced	0.8%
G. No market for timber or other forest products	0.0%
H. Local ordinances	0.0%
I. Harvest would deplete other non-timber values	0.8%
J. Aesthetic issues	7.5%
K. Concerned about harvesting impacts	5.3%
L. Concerned about affecting neighbors	2.3%
M. Concerned about doing damage to my property	2.3%
N. Don't trust loggers	2.3%
O. Don't trust foresters	1.0%
P. Don't trust the forest industry	2.0%
Q. Access too limited to woodlot	0.8%
R. Land is too steep	3.0%
S. Can't find someone to do the harvest	1.5%
T. Don't know how to manage a harvest	1.5%
U. I don't know anything about small-scale harvesting	8.3%
V. Other	21.8%

Table 14 - How PFLs learned about small-scale timber harvesting techniques

	Yes	No	Don't know
A. Attended a meeting	9.3%	88.2%	2.5%
B. Went to a demonstration	5.7%	91.8%	2.5%
C. Read something about it	42.6%	55.6%	1.8%
D. Know someone who is using it	24.4%	70.7%	4.9%
E. Have a neighbor who is using it	13.5%	81.0%	5.5%

Other variables were examined to determine PFL forest product needs. When asked how PFLs would like residual branches and tops from trees handled (if they decided to practice small-scale harvesting), over forty percent (40.6%) indicated they would like them to be gathered to create brush piles, see Table 15. This was followed by an indication they would like branches and tops of trees chipped on-site and scattered (22.8%) and nearly an equal number (22.3%) wanted branches and tops from trees left where they fall. Less than one in ten (9.4%) indicated they would like them chipped on-site and hauled from the site.

Table 15 – The best way to handle residual branches and tops from trees

A. Chipped on-site and hauled	9.4%
B. Chipped on-site and scattered	22.8%
C. Gathered to create brush piles	40.6%
D. Leave them where they fall	22.3%
E. Other	11.9%

As for other forest product needs, three-quarters (75%) of PFLs indicated they had use for firewood/fuelwood, half (55.3%) indicated they would use mulch, while a little over twenty percent indicated they would use sawlogs or woodchips (22.0% and 21.2% respectively), see Table 16. Very few (4.5%) PFLs stated they would use mushroom logs.

Table 16 – PFL forest product needs

	Yes	No	Don't know
A. Firewood/fuelwood	75.0%	22.9%	2.1%
B. Mulch	55.3%	40.6%	4.1%
C. Woodchips	21.2%	71.5%	7.3%
D. Sawlogs	22.0%	66.1%	11.9%
E. Mushroom logs	4.9%	78.7%	16.5%

When asked if they were willing to accept forest products as an alternative to cash income, the majority (84.5%) of PFLs stated they would not accept forest products; only 15.5% stated that they would, see Table 17. Of those that would accept forest products, the majority (20.8%) indicated they would accept firewood, followed by lumber (15.3%) and woodchips (5.9%), see Table 18.

Table 17 – PFL willingness to accept forest products as an alternative to cash income

Yes	15.5%
No	84.5%

Table 18 – Products PFLs would accept as an alternative to cash income

A. Firewood	20.8%
B. Lumber	15.3%
C. Woodchips	5.9%
D. Other	4.5%

The majority (53.5%) of PFLs indicated they would prefer operators to leave skid trails for walking trails, if they permitted small-scale harvesting on their land (see Table 19). In addition, almost half (47.3%) of PFLs stated reducing damage to residual soil erosion was an extremely important issue in deciding whether or not to use small-scale harvesting techniques on their land (see Table 20). In addition, almost forty-six percent of PFLs stated reducing damage to residual trees and improving wildlife habitat was extremely important to them (45.9% and 45.5% respectively). Less than a third of PFLs indicated reducing damage to crops/farmland or noise from harvest operations was extremely important to them.

Table 19 – PFL preference for skid trails used as walking trails if small-scale harvesting was permitted on their land

Yes	53.5%
No	46.5%

Table 20 – Important issues related to PFL willingness to use small-scale harvesting techniques on their land

	Not at all important	Not important	Neither	Important	Extremely Important
A. Reducing noise from harvest operations	15.3%	21.0%	25.6%	27.8%	10.2%
B. Woodlot aesthetics	1.7%	3.5%	8.7%	48.3%	37.8%
C. Reducing damage to crops/farmland	4.1%	8.1%	14.5%	43.6%	29.7%
D. Reducing damage to residual trees	1.1%	0.6%	3.3%	49.2%	45.9%
E. Improving wildlife habitat	1.1%	1.1%	4.5%	47.8%	45.5%
F. Improving access from a road or trail	5.1%	14.6%	23.6%	44.9%	11.8%
G. Reducing soil erosion	0.5%	1.1%	2.7%	48.4%	47.3%

Sociodemographics of PFLs Who Practiced Small-scale Harvesting

In order to improve current educational programs on small-scale harvesting techniques, it is important to understand the individual characteristics and sociodemographics of those who have used it in the past. Knowing the PFL demographics of those who had previously used small-scale harvesting techniques can assist forest managers in targeting programs specific to landowners' needs.

Of those PFLs who used small-scale harvesting techniques, over half (51.1%) owned between one and twenty-four forested acres in their largest parcel; nearly 18% had between twenty-five to forty-nine acres and fifty to ninety-nine acres of forestland (see Table 21). Only 13.3% of PFLs who used small-scale harvesting owned one hundred or more forested acres. However, these differences were not statistically significant.

Table 21 - Frequency of PFL forested acres with small-scale harvesting experience

Forested acres	Harvested	
	Yes	No
1-24	51.1%	48.0%
25-49	17.8%	17.3%
50-99	17.8%	13.3%
100 and up	13.3%	21.3%
Chi-square	1.69	

Almost half (47.6%) of the PFLs who used small-scale harvesting techniques were happy with the small-scale harvesting outcome; nearly two in four (3 8.1%) were very happy with their harvesting experience (see Table 22). A small proportion of PFLs were either unhappy or very unhappy with their harvesting experience (2.4% and 4.8% respectively). These differences were not statistically significant.

Table 22 - Frequency of PFLs' happiness with small-scale harvesting experience

Happiness	Harvested	
	Yes	No
Very unhappy	4.8%	5.8%
Unhappy	2.4%	0.0%
Neither	7.1%	13.5%
Happy	47.6%	61.5%
Very happy	38.1%	19.2%
Chi-square	5.96	

Most PFLs who used small-scale harvesting techniques were male (83.3%), 53 years of age, and lived in a household with about 2.5 persons (see Tables 23, 24, and 25). Almost all (97.8%) PFLs that practiced small-scale harvesting were Maryland residents and had lived in the state an average of 46 years (see Tables 26 and 27). In addition, of those who had used small-scale harvesting techniques, over half (51.1%) lived in the countryside located in a rural area (see Table 28).

Table 23 - Gender of PFLs who practiced small-scale timber harvesting

Gender	Harvested	
	Yes	No
Male	83.3%	71.3%
Female	16.7%	28.7%
Chi-square	2.4	

Table 24 - Mean age of PFLs who practiced small-scale timber harvesting

Harvested	Age
Yes	52.9
No	57.5
F-test	4.0*

* $p < .05$

Table 25 - Mean household size of PFLs who practiced small-scale timber harvesting

Harvested	Household size
Yes	2.5
No	2.6
F-test	0.3

Table 26 - Maryland residence for PFLs who practiced small-scale timber harvesting

Residence	Harvested	
	Yes	No
Yes	97.8%	92.4%
No	2.2%	7.6%
Chi-square	1.7	

Table 27 - Mean length of residence for Marylanders who practiced small-scale timber harvesting

Harvested	Years lived in Maryland
Yes	45.9
No	46.7
F-test	0.0

Table 28 - Size of place of PFLs who practiced small-scale timber harvesting

Size of place	Harvested	
	Yes	No
In a large city	0.0%	2.8%
In a suburban area outside a large city	8.9%	13.3%
In a small city	4.4%	7.0%
In a suburban area outside a small city	17.8%	18.9%
In a town or village located in a rural area	17.8%	11.2%
In the countryside located in a rural area	51.1%	46.9%
Chi-square	3.5	

Most PFLs (30.2%) who used small-scale harvesting techniques indicated their political views were moderate-conservative, followed by conservative (23.3%), moderate-liberal (20.9%), and didn't know (14.0%). Very few PFLs in this sample were moderate-liberal or liberal (7.0% and 4.7% respectively), see Table 29.

Table 29 - Political affiliation of PFLs who practiced small-scale harvesting

Political affiliation	Harvested	
	Yes	No
Conservative	23.3%	30.4%
Moderate-conservative	30.2%	23.7%
Moderate	20.9%	14.8%
Moderate-liberal	7.0%	11.9%
Liberal	4.7%	5.2%
Don't know	14.0%	14.1
Chi-square	2.6	

There were mixed results on the association of PFL education to whether or not they used small-scale harvesting techniques (see Table 30). The majority (26.7%) who used small-scale harvesting had some college education, followed by a 4-year college degree (24.4%), a high school degree or GED (22.2%), and an advanced degree (15.6%); few PFLs (11.1%) who used small-scale harvesting had completed a 2-year technical degree.

Table 30 - Level of education of PFLs who practiced small-scale harvesting

Education	Harvested	
	Yes	No
Less than a high school degree	0.0%	2.9%
High school degree or GED	22.2%	22.9%
Some college	26.7%	19.3%
2-year technical or associates degree	11.1%	13.6%
4-year college degree (BA/BS)	24.4%	14.3%
Advanced degree (Master's, Ph.D., JD, MD)	15.6%	27.1%
Chi-square	6.3	

Over half of PFLs (56.8%) who used small-scale harvesting techniques worked full-time, while 34.1% were retired (see Table 31). Very few PFLs who used small-scale harvesting techniques worked part time, were homemakers, or unemployed (2.3% and 4.5% respectively). In addition, most PFLs (over 60%) who used small-scale harvesting techniques tended to have higher income levels ($50,000+) per year and on average 5.8% of their gross income was earned from their land (Tables 32 and 33).

Table 31 - Employment status of PFLs who practiced small-scale harvesting

Employment status	Harvested	
	Yes	No
Full time	56.8%	54.2%
Part time	2.3%	4.9%
Retired	34.1%	36.6%
Student	0.0%	0.0%
Homemaker	2.3%	3.5%
Non-employed (looking for work or laid off)	4.5%	0.7%
Chi-square	3.9	

Table 32 - Mean percentage of gross income earned from land of PFLs who practiced small-scale timber harvesting

Harvested	Percentage Gross Income
Yes	5.8
No	1.9
F-test	2.4

Table 33 - Income of PFLs who practiced small-scale harvesting

Income	Harvested	
	Yes	No
Less than $15,000	0.0%	5.9%
$15,000 to $24,999	3.0%	6.8%
$25,000 to $34,999	24.2%	7.6%
$35,000 to $49,999	12.1%	11.9%
$50,000 to $74,999	27.3%	21.2%
$75,000 to $99,999	18.2%	13.6%
$100,000 or more	15.2%	33.1%
Chi-square	12.53	

Multivariate Analysis

Dependent Variable – PFL Harvesting Intentions

Harvesting intentions is indicated by PFLs' likelihood to harvest timber from their land and was use as the dependent variable in the multivariate analysis. To measure harvesting intentions, survey respondents were asked to indicate their degree of likelihood (1 =very unlikely to 5=very likely) to participate in the following eight harvesting activities: (1) hire a forester to improve their woodlot; (2) trade products with a logger for improvements to their woodlot; (3) sign a harvesting contract with a logger; (4) permit traditional forest equipment on their property; (5) sell forest products to generate income; (6) harvest trees to improve wildlife habitat; (7) harvest trees for their own use; and (8) permit small-scale harvesting techniques on your property. Factor analysis was performed to determine if these eight items held together well enough to adequately measure the same concept – harvesting intentions. The results suggested there was a single dimension consisting of seven[2] of the eight items. High correlations were found among these seven items and the alpha reliability coefficient was 0.87. Based on this reliability indicator, seven items were included in the composite measure of PFL intentions to harvest timber from their land.

Independent Variables

Based on earlier published work, several independent variables were included in this analysis. Size of forest parcel refers to the number of forested acres (in their largest land parcel) held by the landowner. It was measured by landowners' self-reported response to the question "How many acres are forested in your largest parcel?" Based on this data, an interval variable was created to measure forest parcel size (range = 0.25 to 4,000). Forest

[2] Harvest trees for own use was dropped from the analysis since it reported a low factor loading of .23. The alpha value was .85 when this item was included in the reliability analysis for the scale.

Stewardship Program (FSP) experience measured whether respondents had participated in FSP in the past; values were coded 0 for not participated and 1 for participated) (mean = 0.43).

Eight variables were used to measure PFL sociodemographics and ownership characteristics (gender, age, size of place, education, employment status, income, forestland tenure, and forestland part of residence). Age was measured by respondents' self-reported age at the time of survey response. Gender was measured by coding males 1 and females 0. Residence refers to where the respondents' dwell in terms of size of place. Responses were coded: (1) in the countryside located in a rural area; (2) in a town or village located in a rural area; (3) in a suburban area outside a small city; (4) in a small city; (5) in a suburban area outside a large city; and (6) in a large city. Education measured the highest level of education a respondent had completed. Responses were coded: (1) less than a high school degree; (2) high school degree or GED; (3) some college; (4) 2-year technical or associate degree; (5) 4-year college degree; and (6) advanced degree (Master's, Ph.D., JD, MD). Employment status referred to whether the respondent was employed at the time of the survey. Response categories included: (1) full time; (2) part time; (3) retired; (4) student; (5) homemaker; and (6) non-employed (looking for work or laid off). Past studies on PFLs have indicated that retired PFLs are more likely to harvest timber from their land than those who are in the labor force (cf., Birch, 1996; Greene and Blatner, 1986). Therefore, to facilitate its interpretation, this variable was recoded into the following dummy variables: full time, retired (reference), part time; and not in the labor force (student, homemaker, or non-employed). Income measured the respondent's annual household income (before taxes) for the previous tax year (2005). It was treated as a categorical variable. Responses were coded: (1) Less than $15,000; (2) $15,000 to $24,999; (3) $25,000 to $34,999; (4) $35,000 to $49,999; (5) $50,000 to $74,999; (6) $75,000 to $99,999; and (7) $100,000 or more.

Ownership characteristics were measured by two different variables: (1) length of ownership; (2) forestland is part of residence. Length of ownership refers to the number of years the landowner owned their forestland. This was measured by response to the question "When did you first acquire this forested land?" with the response indicated by a specific year. An interval variable was created by subtracting the year indicated from 2006 (the year the survey was administered). Forestland as part of residence was measured by asking respondents to indicate if their forestland was their primary residence; values were coded 1 for yes and 0 for no.

Five variables measured PFL forest values and attitudes (responsibility for the forest, consumptive forest benefits, nonconsumptive forest benefits, anthropocentric values about the treatment/care for the forest, and biocentric values about the treatment care of the forest). Responsibility for the forest measured who PFLs believe should be responsible for making decisions about private forestland. Respondents were asked the question:

> *Some people think that only the owner of private forestland is responsible for deciding about the conservation of this land. Others feel that since future generations will be afected by how well the forestland is taken care of today, the*

government should have a say about this. Which of the following best describes your feelings about caring for forestland?

This measure was treated as a categorical variable. Response values were dummy coded: (0) landowners should have the sole responsibility; and (1) landowners and the government should share the responsibility.

Importance of benefits of the forest was measured by asking respondents to indicate how important each of the following forest benefits were to them: (1) timber production; (2) renewable resource; (3) wildlife habitat; (4) jobs and employment; (5) scenic beauty; (6) peace of mind; (7) recreation; (8) fuel source; (9) clean air; (10) clean water; and (11) soil protection. Responses were measured with a five item Likert scale where "1" was not at all important and "5" was extremely important. Exploratory factor analysis of these items revealed that two factors emerged to measure importance of benefits of the forest: consumptive and nonconsumptive benefits.

The consumptive benefits factor included timber production, renewable resource, jobs and employment, and fuel source. The non-consumptive factor included wildlife habitat, scenic beauty, peace of mind, clean air, clean water, and soil protection. Reliability analysis was used to assess the extent to which the items in the created scales were related to each other. The alpha value for the consumptive benefits scale was .77 and it was .88 for the nonconsumptive benefits scale. Based on the reliability assessment, two composite scales measuring the relative importance of forest benefits to PFLs were created by summing the responses to these items and dividing by the number of questions answered.

Anthropocentric values about the treatment and care of the forest were measured by asking respondents to indicate their general attitude about caring for forestland. Responses were measured with a five-item Likert scale whose values ranged from "1" strongly disagree to "5" strongly agree. Following exploratory factor analysis, the following statements were included in the composite measure of anthropocentric values about caring for the forest:

With proper care, people can use the forests for many diferent purposes without a lot of conflict among these uses.

It makes sense for a forest landowner to have an overall plan for using and taking care of forestland.

People need more information on what could be done to take better care of the forest.

Reliability analysis assessed the extent to which those items in the scale held together to adequately measure anthropocentric values; the alpha reliability coefficient for this measure was .72.

Respondents were also asked to indicate their general attitude about a series of five statements about forestland (response values ranged from "1" strongly disagree to "5"

strongly agree). Exploratory factor analysis failed to confirm that these items held together as a sufficient measure of biocentric values of the forest. Items considered anthropocentric values of the forest (items b, d, and e in Table 8) were reversed coded. These items were then factor analyzed and tests for reliability performed. However, four out of the five factor loadings for these items were below .500 and the reliability coefficient for these items was low ($\alpha = .54$).

Because this variable was a key construct in measuring PFLs' forest values and attitudes, a decision was made to select one item to use in the analysis. Response distributions were examined to select the item that had the highest variation in responses. The statement, "forests have a right to exist for their own sake, regardless of human concerns and uses" was selected to measure biocentric values about the treatment of the forest since it reported the highest variance (1.39) and distribution of responses among all items in the question.

Use of forests was measured by PFL harvesting experience. Past harvesting experience was measured by asking respondents if they had harvested trees from their land in the last 10 years (response values were coded 1 for yes and 0 for no).

Biophysical and Social Factors Related to Harvesting Intentions

A multiple regression model was used to assess PFL intentions to harvest timber from their land. Sixteen independent variables were included in five individual models (Table 34). These models represented variable groupings based on biophysical (forest) characteristics, sociodemographic (PFL) characteristics, attitudes (PFL values) toward the forest, forest uses (PFL harvesting experience), and interactions of sociodemographics and sociocultural variables. All variables were entered into an overall model and a reduced model containing only significant variables was developed. In the final model, nonsignificant variables were omitted to obtain the most parsimonious model.

The first model tested the effect of two biophysical and control variables (forest parcel size, and Forest Stewardship Program - FSP) on harvesting intentions. Both forest parcel size and FSP experience were significant and positively related to harvesting intentions. This indicates that as forest parcel size increased, harvesting intentions also increased. Also, PFLs who had FSP experience were more likely to harvest than those with no prior experience. This model accounted for 8% of the total variation (Adjusted R^2=.08).

Model 2 added eight PFL sociodemographics (gender, age, size of place, education, employment status, income, forestland tenure, and forestland part of residence) to the regression analysis. Employed part time was statistically significant and negatively related to harvesting intentions. This meant that PFLs employed part time were more likely to harvest than retired PFLs. Forest parcel size and FSP experience increased in their relationship with the dependent variable. These variables accounted for 17% of the variance in the model (Adjusted R^2=.17).

Model 3 represents PFL forest attitudes and values toward harvesting intentions. Five variables (responsibility for the forest, consumptive forest benefits, nonconsumptive forest benefits, anthropocentric values about the treatment/care of the forest, and biocentric values about the treatment/care of the forest) were included to measure individual

Table 34 - Comparison of Five Multivariate Models of Biophysical and Social Factors Associated with PFL Harvesting Intentions

	Model 1	Model 2	Model 3	Model 4	Model 5	Reduced Model
	----- Standardized Regression Coefficients -----					
Biophysical Variables						
Forest parcel size (in acres)	***0.24	***0.29	*0.20	*0.19	*0.16	*0.18
FSP experience (yes=1)	**0.20	*0.21	0.13	0.14	*0.17	
Sociodemographic Variables						
Gender (males=1)		-0.10	-0.12	-0.15	*0.51	
Age		-0.12	0.04	0.07	-1.17	**-1.83
Residence (size of place)		0.09	0.03	0.00	0.67	
Education		0.11	0.13	0.19	0.13	
Employment status (retired=reference)						
Full time		0.13	0.18	0.19	**0.30	
Part time		**-0.26	*-0.19	*-0.19	-0.15	*-0.18
Not in the labor force (student, homemaker, or non-employed)		-0.14	-0.08	-0.07	-0.12	
Income		-0.12	-0.09	-0.09	-0.13	
Years owned forestland		0.06	-0.03	-0.06	*-0.49	
Forestland part of residence (yes=1)		0.13	0.07	0.03	0.04	
Sociocultural Variables						
Responsibility for the forest (landowners & govt. share resp.=1)			0.13	0.09	0.14	
Consumptive benefits of the forest			0.16	0.14	-0.25	
Nonconsumptive benefits of the forest			-0.11	-0.10	-0.10	
Anthropocentric values			*0.23	*0.21	*-0.77	**-0.96
Biocentric values			*-0.24	*-0.23	-0.62	***-0.25
Forest Uses						
Harvested timber on land (yes=1)				*0.17	0.12	*0.15
Interactions						
Gender X responsibility for the forest					**-0.80	
Age X anthropocentric values					**1.87	**2.06
Age X biocentric values					-0.87	
Residence X consumptive benefits					0.80	
Yrs owned forestland X resp. for the forest					***0.90	
Years owned forestland X biocentric values					-0.31	
df	2	12	17	18	24	9
Adjusted R_2	***0.08	***0.17	***0.29	***0.32	***0.53	***0.25
F-change	***8.83	***3.12	***3.71	***3.76	***6.08	***6.43
N	179	128	112	108	108	152

* significant at the .05 level ** significant at the .01 level *** significant at the .001 level

PFL forest values. Anthropocentric values about the treatment and care of the forest was statistically significant and positively related to PFL harvesting intentions. This indicated that PFLs who valued the forest more for its ability to meet human needs were more likely to harvest timber. Biocentric values about the treatment and care of the forest was negatively related to harvesting intentions. PFLs who view the forest as sacred and value it for its intrinsic worth were less likely to harvest timber from their land. In this model, both forest parcel size and part time employment decreased in their relationship with harvesting intentions while FSP experience became nonsignificant in its

relationship to the dependent variable. The introduction of these variables in the regression analysis accounted for 29% of the cumulative variance (Adjusted R^2=.29).

In Model 4, forest uses (PFL harvesting experience) was introduced. Part time employment increased marginally in significance. However, anthropocentric and biocentric values decreased somewhat in their relationship with the dependent variable. Harvested trees from land in the past ten years was marginally significant and positively related to harvesting intentions. The addition of forest uses to the model explained 31% of the total variance (Adjusted R^2=.31).

Model 5 added the significant interactions to the model. Because PFLs' individual sociodemographic characteristics are antecedent factors of their forest values and attitudes and forest uses, it was expected that interactions would be found in the analysis. To assess the interactive effect of sociodemographics, sociocultural characteristics, and forests uses on PFL intentions to harvest, a series of interactions were calculated and analyzed along with the main effects. These interactions were then incorporated into the aggregated regression model to determine if the addition of the interactive terms contributed to the explanation of variance in the model. Overall, three main effects and three interactions were statistically significant in their relationship with harvesting intentions.

Forest parcel size, FSP experience, and the main effect of full time employment were significant in this model. The interactions involving gender, age, responsibility for the forest, years owned forestland, and anthropocentric values about the treatment/care of the forest were statistically significant. PFL's gender and who they believed should be responsible for private forestland interacted to determine their harvesting intentions; the interaction of gender and responsibility for the forest was significant and negatively related to harvesting intentions. This meant that females who believed responsibility for private forestland should be shared by both landowners and government were significantly less likely to harvest than those who believed forestland should be the sole responsibility of landowners.

In addition, PFL's age interacted with their anthropocentric values about the treatment/care of fore stland on their intentions to harvest timber. The interactive effect of age and anthropocentric values about the treatment and care of the forest with harvesting intentions was significant and positively related to harvesting intentions. For PFLs age 57 and older, as their anthropocentric values about the treatment/care of forests increased, their intentions to harvest also increased.

Also, PFL forestland tenure and who they believed should be responsible for private forestland interacted to predict harvesting intentions. The interaction of years owning forestland and responsibility for the forest was significant and positive in its relationship with the dependent variable. This indicated as PFLs forestland tenure increased, those who believed landowners and the government should share responsibility for private forestland intentions to harvest timber also increased.

Forest parcel size was marginally significant in its relationship to the dependent variable. As tract size increased so did their intentions to harvest timber. FSP experience became

significant in its relationship to harvesting intentions in this model; PFLs with prior FSP experience were more likely to harvest timber from their land than those who had no experience. Also, full time employment became significant in its relationship with harvesting intentions. PFLs employed full time were significantly more likely to harvest timber from their forestland than retired PFLs. This model accounted for 53% of the explained variance (Adjusted R^2=.53).

In the final reduced model, five variables were statistically significant. Three were positively related to the dependent variable – forest parcel size, harvesting experience, and the interactive effect of age and anthropocentric values about the forest. As forest parcel size increased, PFL intentions to harvest also increased. Also, PFLs with past harvesting experience were more likely to harvest timber than those who had not harvested. For PFLs 57 and older, as anthropocentric values about the treatment and care of the forest increased, so did their harvesting intentions.

The remaining two items were negatively related to the dependent variable – part time employment and biocentric values about the treatment/care of the forest. PFLs employed part time were significantly less likely to harvest timber than retired PFLs. As PFLs expressed greater values for the intrinsic worth of forests, their intentions to harvest timber from their land decreased. The final reduced model accounted for 25% of the cumulative variance (Adjusted R^2=.25).

SUMMARY AND CONCLUSION

This study reflects input from 202 PFL residents of Allegany County, Maryland who participated in a mail survey conducted in 2006 on landowner perspectives on forest management. The survey instrument was designed to obtain information on PFL characteristics, their attitudes toward forest management, and harvesting behavior. The central question of this study was, "what factors are related to PFL perspectives on forest management, timber harvesting, and small-scale timber harvesting?"

The responses from PFL respondents in Allegany County provided insight into landowner characteristics, their values and attitudes about the forest, and their harvesting behavior. Almost half of PFLs had harvested timber on their land before. More importantly, of those PFLs with harvesting experience, a majority owned forest parcels of 24 acres or less. Those PFLs who had used small-scale harvesting techniques in the past were male, generally younger, had higher incomes, with some college education, lived in rural areas, and worked full time. Overall, almost twenty-four percent of PFLs had used small-scale harvesting techniques in the past.

In examining the biophysical and social factors associated with PFL harvesting intentions we cannot conclude whether PFLs in Allegany County are timber-oriented. For the most part, PFLs valued the forest more for its intrinsic worth and expressed a genuine reverence toward them. At the same time they valued the forest as a renewable natural resource capable of meeting human needs.

These results suggest that the ability of biophysical indicators to explain harvesting and management activities is more complex than previous work suggested. Overall, the biophysical characteristics of PFLs' forestland contributed minimally in explaining intentions to harvest timber. Sociocultural and sociodemographic factors were stronger predictors and provided more explanatory power.

This project advances current research on small woodlot owners, their forest values and attitudes, and their harvesting behavior. The methodologies used in this study, while developed and applied specifically in Allegany County, could serve as a protocol to enhance our understanding of PFLs across Maryland and the Northeast. An improved understanding of PFLs can assist state and national forest agencies in developing private forest management programs specific to landowners' needs and objectives.

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