

## Characteristics of Non-Industrial Private Forest Owners Interested in Managing Their Land for Nontimber Forest Products

### Abstract

Non-industrial private forest owners in 16 states were surveyed about their interest in learning about managing their land for nontimber forest products. T-tests of means, Mann-Whitney U-tests, and cross-tabulations identified land tenure, resource management, and socio-demographic characteristics associated with interest in nontimber forest products. Our results indicate that landowners likely to be interested in managing for NTFPs are those who have more formal education, are active forest managers, have greater access to forested land, and prior experience or familiarity with nontimber forest products.

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### Introduction

Forest farming is one potential approach for non-industrial private forest (NIPF) owners interested in diversifying their livelihood options by producing multiple products and services (Kays, 2004). Although forest farming can include timber production, its distinctive feature is the production of nontimber forest products (NTFPs), such as evergreen boughs, cones, syrups, resins, nuts, or seeds (Teel & Buck, 2002). Management techniques can range from encouraging optimal habitat for wild species to intensive cultivation of forest species.

Only 18% of NIPF owners participating in the 2003 National Woodland Owners Survey (NWOS) (Butler, 2008) reported that NTFPs were harvested or collected on their land. A few studies have explored links between landowner characteristics and interest in NTFPs (Strong & Jacobson, 2006; Valdivia, Konduru, Raedeke, & Green, 2003; Flower, Valdivia, & Dorr, 2005). In a survey of woodland owner groups in Pennsylvania, Strong and Jacobson (2006) found that 36% of the respondents were interested in forest farming. These were more likely to be women, have off-farm or forest income, smaller landholdings, and shorter tenure on the land. They were also more interested in aesthetic

and environmental benefits than other landowners.

Among Missouri farmers, Flower et al. (2005) and Valdivia and Poulos (2005) found a positive relationship between interest in forest farming and knowledge level and familiarity with forest farming. Membership in conservation groups was also positively correlated with interest in forest farming. Interest was also higher among landowners who had harvested trees for sale. These few and localized studies are a first step toward developing more detailed understandings of whether and how landowners interested in managing for NTFPs differ from other landowners.

## Objectives

In spring 2010, we implemented a random sample mail survey of 2,950 forest owners to identify key characteristics of landowners interested in integrating NTFPs into their land management activities. Our research builds on previous studies by expanding the geographic scope to the national scale.

## Methods

Using Dillman's (2000) survey method, in April 2010 we mailed an eight-page survey to 2950 NIPF landowners in the states shown in Figure 1. Landowners with acreages ranging from 10 to 5,000 acres were targeted, and the mailing was followed by a postcard to those who did not return the survey within 3 weeks. We excluded landowners with fewer than 10 acres because of the high potential for sampling error (Butler, 2008).

The survey focused on states in the Northeast, Adirondacks, Ozarks, Appalachians, Great Lakes, and Pacific Northwest, regions that are known hotspots of NTFP activity. We pre-tested the survey with a national NTFP expert advisory group and conducted a pilot test of 100 landowners.

We randomly selected potential respondents from each state, using the 2003 NWOS figures for the proportion of NIPF owners within each state as a guide for the state's target sample size. For states with insufficient leads to reach our target, we selected additional respondents from the other states. Although the results for states with a sufficiently large sample size are generalizable to the state level, the analyses for the full dataset cannot be generalized to the 16-state landowner population. Nonetheless, the full dataset analyses provide an indication of the characteristics of landowners interested in NTFPs for a broader area than in previous studies.

A total of 567 useable surveys were returned, for a response rate of 19.2%. We did not test for non-response bias. A comparison of the overall respondent profile with the 2003 NWOS results indicates that our respondents tended to be more likely to live off-site and had more education, more land, and more land in forest cover.

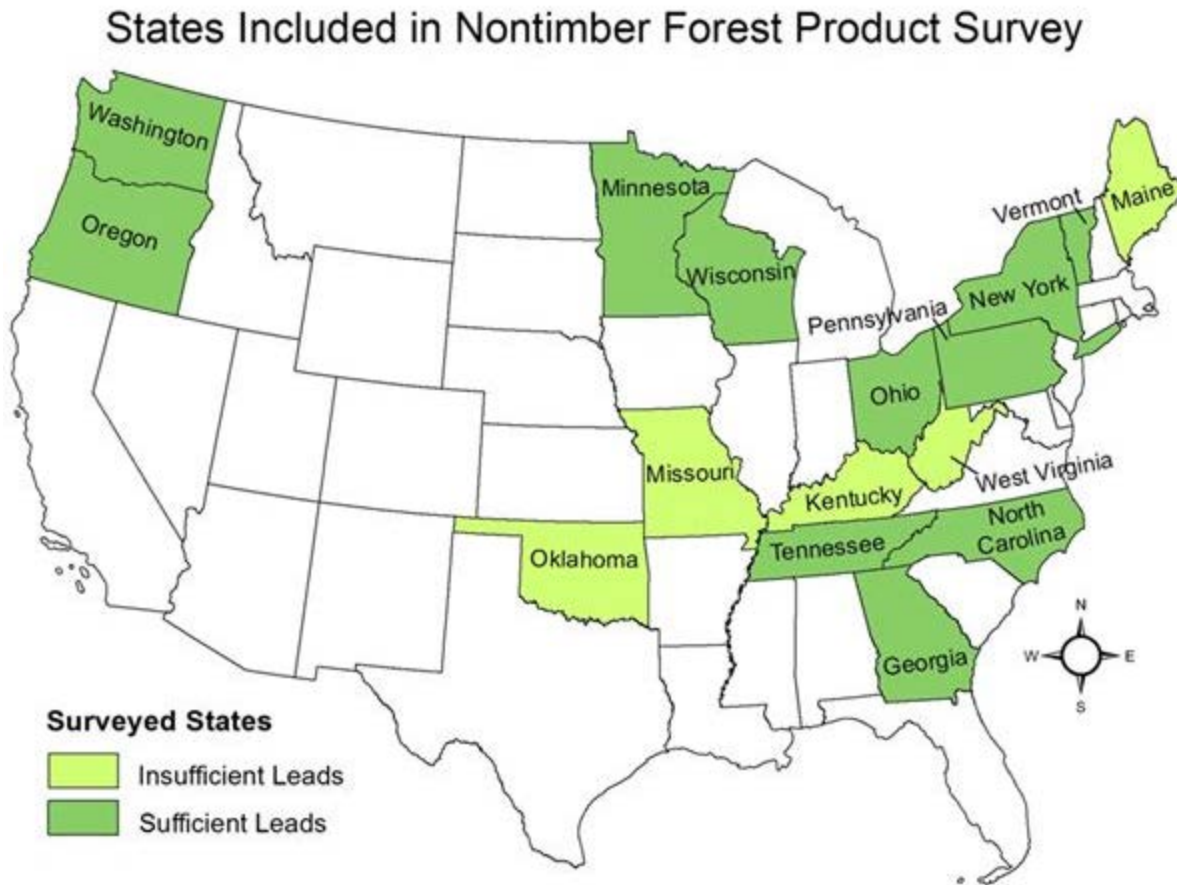
We collected data about land tenure, land management, NTFP activity and knowledge, and socio-demographics. We performed cross-tabulations using SPSS software for all ordinal and nominal variables, with "Interest in NTFPs" as the dependent variable. We ran t-test of means for independent samples on age and length of tenure, comparing those interested in managing for NTFPs with those not interested. We ran Mann Whitney U tests of means for landholding size and percent forest cover to compare the two groups as those variables did not have normal distributions. For all tests we used  $p \leq .05$  as the cut-off for statistical significance.

## Results

### Overview of Respondent Characteristics

Only 13 respondents (2%) currently buy or sell NTFPs. Respondents who buy or sell NTFPs were geographically dispersed, owning land in North Carolina, New York, Ohio, Minnesota, Oregon, Washington, and Wisconsin. Less than one-third of the respondents were somewhat or very familiar with NTFPs, and only 13% had harvested NTFPs on their land. This figure was lower than for the NWOS, where 18% had harvested NTFPs on their land. However, three-quarters of the respondents were somewhat or very interested in learning how to manage their land for NTFPs.

**Figure 6.**  
Geographic Extent of Survey



About one-third (35%) of the respondents lived on their land, a figure that is considerably lower than for the NWOS respondents, 75% of whom lived on their forested land. Only 11% of the respondents belonged to a forestry or conservation association. The percent of respondents who had certified their land under forestry programs was 10%; this is roughly the same as for the NWOS (8%). Although the percentage of respondents with forest management plans was low (22%), it was considerably higher than for the NWOS respondents (4%).

### Comparison Between Landowners Interested in NTFPs and

## Those Not Interested

Landowners interested in managing for NTFPs were more likely to be familiar with NTFPs (33.6%) compared with those not interested in NTFPs (18.8%). They were also more likely to harvest NTFPs on their land (15.3%) than those not interested in NTFPs (7.9%). Regional differences in presence/absence of interest in NTFPs between landowners were not statistically significant.

Table 1 compares landholder characteristics by presence/absence of interest in NTFPs. Landowners interested in NTFPs had more land, more land in forest cover, had owned their land for a shorter period of time, and tended to be slightly younger in age. All of these differences were statistically significant at the  $p = .05$  level.

**Table 1.**  
 Mann-Whitney U and T-Test of Means for Land Tenure Characteristics and Age

Landowner Variables	NTFP Interest	N	Mean	Standard deviation	T-test or Mann-Whitney-U test	Significance (2-tailed)
Acres owned <sup>^</sup>	No	144	86	99	2.504	.012*
	Yes	405	144	312		
Percent of land in forest <sup>^</sup>	No	140	67	33	3.612	<.001*
	Yes	401	80	23		
Length of tenure (years)	No	139	26	16	2.23	0.027*
	Yes	389	22	14		
Age	No	140	66	13	4.29	<.001*
	Yes	395	61	12		
<sup>^</sup> Analyzed using Mann-Whitney U test. *Statistically significant at the $p$ equal to or less than .05 level.						

Table 2 indicates the relationship of interest in NTFPs to landowner plans for the land. Landowners interested in NTFPs were more likely to have plans to harvest timber and less likely to have plans to leave the land as it is. They were somewhat more likely to have plans to sell the land, but the percent intending to sell was quite small (4.9%) and only significant at the  $p = .10$  level. Although landowners interested in NTFP management were more likely to have plans to harvest NTFPs, the number with plans to harvest NTFPs was very small (4.7%), and the difference was not statistically significant.

Table 3 summarizes the relationship between interest in NTFPs and management behavior and conservation group membership. Landowners interested in NTFPs were more likely to have a management plan and to have inventoried their timber. They were also more likely to participate in sustainable forestry programs and to be members in a forestry or landowner association.

**Table 2.**  
Crosstabulations for NTFP Interest by Plans for the Land

Plans for the Land in Next 5 Years	Interested in NTFP Management				N	Chi-square	DF	P-value
	Yes		No					
	Freq.	%	Freq.	%				
Plans to sell	20	4.9	2	1.4	551	3.448	1	.063**
Doesn't plan to sell	387	95.1	142	98.6				
<b>Total</b>	<b>407</b>	<b>100</b>	<b>144</b>	<b>100</b>				
Plans to harvest timber	107	26.3	18	12.5	551	11.532	1	.001*
Doesn't plan to harvest timber	300	73.7	126	87.5				
<b>Total</b>	<b>407</b>	<b>100</b>	<b>144</b>	<b>100</b>				
Plans to leave as is	194	47.7	86	59.7	551	6.186	1	.015*
Doesn't plan to leave as is	213	52.3	58	40.3				
<b>Total</b>	<b>407</b>	<b>100</b>	<b>144</b>	<b>100</b>				

\* Significant at the p equal to or less than .05 level \*\* Significant at the p equal to or less than .10 level

**Table 3.**  
Crosstabulations for NTFP Interest by Management Behavior and Group Membership

Landowner Variables	Interested in NTFP Management				N	Chi-square	DF	P-value
	Yes		No					
	Freq.	%	Freq.	%				
Has management plan	103	26.1	17	12.5	531	10.66	1	.001*

Has no management plan	292	73.9	119	87.5				
<b>Total</b>	<b>395</b>	<b>100</b>	<b>136</b>	<b>100</b>				
Has inventoried timber	164	43.3	45	33.3	514	4.08	1	.044*
Has not inventoried timber	215	56.7	90	66.7				
<b>Total</b>	<b>379</b>	<b>100</b>	<b>135</b>	<b>100</b>				
Land in certification program	47	11.5	8	5.6	550	4.17	1	.041*
Land not certified	360	88.5	135	94.4				
<b>Total</b>	<b>407</b>	<b>11.5</b>	<b>143</b>	<b>100</b>				
Group member	54	13.8	3	2.2	524	13.96	1	<.001*
Not a group member	336	86.2	131	97.8				
<b>Total</b>	<b>390</b>	<b>100.0</b>	<b>134</b>	<b>100</b>				
* Statistically significant at the p equal to or less than .05 level.								

Table 4 describes the relationship between interest in NTFPs and views on joint production. Respondents interested in managing for NTFPs were more likely to agree that timber and NTFPs can be managed jointly.

**Table 4.**  
Crosstabulations for NTFP Interest and Views on Joint Production

<b>Response to Statement: Timber and NTFPs Can Be Managed Jointly</b>								
Disagree	13	3.5	21	16.9	492	68.94	2	<.001*
Neutral	109	29.6	70	56.5				
Agree	246	66.8	33	26.6				
Total	368	100	124	100				
* Statistically significant at the p equal to or less than .05 level.								

Table 5 shows that landowners interested in NTFPs were more likely to have someone in the household working off-site and had more formal education. Those at the lower and upper ends of the income scale were less likely to be interested in managing for NTFPs. The differences between

men and women were not statistically significant.

**Table 5.**  
Crosstabulations for NTFP Interest by Socio-Demographic Characteristics

Socio-Demographic Characteristics	Interested in NTFP Management				N	Chi-square	DF	P-value
	Yes		No					
	Freq.	%	Freq.	%				
At least one off-site worker	187	56.8	44	39.3	441	10.32	1	.001
No off-site worker	142	43.2	68	60.7				
<b>Total</b>	<b>329</b>	<b>100</b>	<b>112</b>	<b>100</b>				
<b>Educational Level</b>								
No high school diploma	9	2.3	13	9.1	543	14.888	3	.002*
High school diploma or GED	114	28.5	47	32.9				
2-year college/trade school	70	17.5	22	15.4				
4-year college degree or more	207	51.8	61	42.7				
<b>Total</b>	<b>400</b>	<b>100.1</b>	<b>143</b>	<b>100.1</b>				
<b>Annual Household Income</b>								
Less than \$15,000	9	2.9	5	4.9	417	16.562	7	.020*
\$15,000 to \$34,999	45	14.3	23	22.5				
\$35,000 to \$49,999	58	18.4	27	26.5				
\$50,000 to \$74,999	84	26.7	14	13.7				
\$75,000 to \$99,999	44	14	11	10.8				
\$100,000 to \$129,999	48	15.2	9	8.8				
\$130,000 to \$149,999	9	2.9	5	4.9				
More than \$150,000	18	5.7	8	7.8				
<b>Total</b>	<b>315</b>	<b>100.1</b>	<b>102</b>	<b>99.9</b>				
* Significant at the p equal to or less than .05 level								

## Comparison of Landowners by Level of NTFP Interest

Of the 407 landowners who expressed an interest in learning about NTFPs, 70% were only somewhat interested, while 30% were very interested. Landowners very interested in NTFPs were slightly younger (58 versus 61 years old) and more likely to have land in a certification program (19% versus 8%). They were more likely to be familiar with NTFPs (41% versus 31%), to have harvested NTFPs on their own land (22% versus 13%), and to have plans to harvest NTFPS (8% versus 3%). The differences for other variables were not statistically significant.

## Conclusion and Implications

The survey revealed that interest in NTFPs within the 16 states included in the study was associated with slightly younger, well-educated landowners with incomes between \$35,000 and \$100,000. Landowners interested in NTFPs had larger landholdings and longer tenure. They were more active forest managers and were more likely to participate in conservation-oriented groups. They also were more likely to have some familiarity with NTFPs.

Our findings were similar to Flower et al.'s (2005) and Valdivia and Poulos' (2005) results about agroforestry practices among Missouri farmers. However, they differed from Strong and Jacobson's (2006) findings for Pennsylvania woodland owners in that interest in NTFPs among our respondents did not differ by gender, nor was it linked to smaller landholdings. One possible explanation for this difference is that Strong and Jacobson's study included holdings of fewer than 10 acres, which we excluded.

Although many respondents were interested in learning about managing for NTFPs, very few harvested NTFPs on their land or operated NTFP businesses. The gap between interest in NTFPs and the adoption of forest farming practices points to the need for Extension programs that can assist NIPF owners to identify appropriate NTFP management practices, whether the products harvested are destined for personal use or sale.

The low survey response rate, however, means that the patterns identified must be viewed as preliminary and potentially valid for only a segment of the NIPF population. A comparison of the overall respondent profile with the 2003 NWOS findings suggests that the results may be skewed toward NIPF owners who live off-site and who have more land and education. Extension programs wishing to target NTFP programming at NIPF owners who live on-site and who have less education and land will need to first determine the level of interest in NTFPs within that population, as well as whether they already have NTFP harvesting or business experience.

Among our respondents, landowner interest in NTFPs was linked with length of tenure, size of holdings, a timber management plan, and membership in conservation groups. Extension educators can identify landowners who fit this profile through the use of tax assessor and professional forester lists and conservation association membership directories, a strategy that Mercker and Hodges (2007) identified as useful for forest certification programs.

The positive link between interest in NTFPs and participation in timber management activities



suggests that Extension programs might emphasize assisting landowners to develop management plans focused on joint production of timber and NTFPs. A related direction for forestry and conservation Extension is providing assistance that enables landowners to take advantage of opportunities for linking NTFP management with payment for ecosystem services programs. For landowners interested in developing NTFP businesses, a focus on joint production calls for business Extension programs that provide NIPF owners with the skills, knowledge, and network connections needed to operate businesses based on the provision of a broad suite of products and services.

Broad surveys have been used within forestry Extension to develop better-targeted educational materials and programming for NIPF owners in agroforestry, forest certification, and sustainable timber management (Joshi & Arano, 2009; Zhao, Butler, Kittredge, & Catanzaro 2012; Magill, McGill, & Fraser, 2004; Rickenbach & Kittredge, 2009; Workman, Bannister, & Nair, 2003). Our survey results can be used in similar ways. For example, we found that landowners interested in NTFPs are likely to be newer owners and more educated. Mercker and Hodges' (2007) research suggests that active educational activities such as talking with foresters and other NIPF owners and passive education in the form of videos and websites are more likely to reach this demographic. The link between interest in NTFPs and active forest management and participation in conservation groups suggests that integrating NTFPs with timber management planning and presenting educational programs at conservation group meetings are also likely to succeed as delivery options for NTFP education.

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