The Supporting Statement OMB No. 0596-0078

National Woodland Owner Survey

July 2015

Note: This request is for the reinstatement of the previously approved information collection OMB 0596-0078, the National Woodland Owner Survey (NWOS). The USDA Forest Service allowed the collection to expire in order to process all data collected to date, produce the summary reports from these data, and plan for the next iteration of the survey. The Forest Service is now requesting approval from OMB to once again collect information from owners of forest and other wooded land.

B. Collections of Information Employing Statistical Methods

1. **Describe (including a numerical estimate) the potential respondent universe and any sampling or other respondent selection method to be used. Data on the number of entities (e.g., establishments, State and local government units, households, or persons) in the universe covered by the collection and in the corresponding sample are to be provided in tabular form for the universe as a whole and for each of the strata in the proposed sample. Indicate expected response rates for the collection as a whole. If the collection had been conducted previously, include the actual response rate achieved during the last collection.**

   Respondent Universe: Based on the previous iteration of the NWOS, there are an estimated 11.3 million private ownerships of forest and other wooded land in rural areas of the United States. The number of state and local government agencies managing forest and other wooded land is unknown and determining this number is one of the objectives of this information collection. The number of owners and managers of trees in urban areas is also unknown, and also a question we are trying to answer.

   Sampling: The sample is stratified by broad ownership category, by rural versus urban, and by state. The three ownership categories are large corporate private, other private, and non-federal public. Large corporate is defined as ownerships that are corporations and have at least 250,000 acres of forest or other wooded land in the U.S. The area of land covered by trees is used to stratify rural (greater than or equal to 1 acre) versus urban (at least one tree, but less than 1 acre).

   The target sample size for the rural small private owners is 250 respondents per state as determined in *USDA Forest Service, National Woodland Owner Survey 2011-2013: Design, Implementation, and Analytical Methods* (USDA Forest Service Gen. Tech. Rep. in process). For large rural, the goal is to contact all of them. It is also our intention to contact all state agencies that manage rural forest and other wooded land and up to 1,800 local agencies. The target sample size for private owners in urban areas is 100 per metropolitan area. There are currently no plans to contact public agencies in urban areas, but this could potentially be addressed in future collection efforts.

Table B-1: Estimated numbers of ownerships/managers and target number of responses (listed parenthetically) for the National Woodland Owner Survey by rural-urban, ownership category, and state strata.

State	Rural			Urban	
	Private		Public		
	Large corporate	Other private	Public, non-federal	Private	Public
Alabama	10	253,000	Unknown	Unknown	Unknown
	(10)	(250)	(50)	(0)	(0)
Alaska	0	67,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Arizona	0	80,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Arkansas	5	181,000	Unknown	Unknown	Unknown
	(5)	(250)	(50)	(0)	(0)
California	5	268,000	Unknown	Unknown	Unknown
	(5)	(250)	(50)	(0)	(0)
Colorado	0	34,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Connecticut	0	161,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Delaware	0	21,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Florida	5	235,000	Unknown	Unknown	Unknown
	(5)	(250)	(50)	(0)	(0)
Georgia	5	461,000	Unknown	Unknown	Unknown
	(5)	(250)	(50)	(0)	(0)
Hawaii	0	87,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Idaho	0	28,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Illinois	0	146,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Indiana	0	195,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Iowa	0	81,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Kansas	0	100,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Kentucky	5	413,000	Unknown	Unknown	Unknown
	(5)	(250)	(50)	(0)	(0)
Louisiana	5	138,000	Unknown	Unknown	Unknown
	(5)	(250)	(50)	(0)	(0)
Maine	15	169,000	Unknown	Unknown	Unknown
	(15)	(250)	(50)	(0)	(0)
Maryland	0	143,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(100)	(0)
Massachusetts	0	239,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)

State	Rural			Urban	
	Private		Public		
	Large corporate	Other private	Public, non-federal	Private	Public
Michigan	5	351,000	Unknown	Unknown	Unknown
	(5)	(250)	(50)	(0)	(0)
Minnesota	5	215,000	Unknown	Unknown	Unknown
	(5)	(250)	(50)	(0)	(0)
Mississippi	5	286,000	Unknown	Unknown	Unknown
	(5)	(250)	(50)	(0)	(0)
Missouri	0	449,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Montana	5	73,000	Unknown	Unknown	Unknown
	(5)	(250)	(50)	(0)	(0)
Nebraska	0	41,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Nevada	0	5,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
New Hampshire	0	205,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
New Jersey	0	120,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
New Mexico	5	261,000	Unknown	Unknown	Unknown
	(5)	(250)	(50)	(0)	(0)
New York	0	794,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
North Carolina	5	564,000	Unknown	Unknown	Unknown
	(5)	(250)	(50)	(0)	(0)
North Dakota	0	26,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Ohio	0	488,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Oklahoma*					
East	0	89,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
West	0	173,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Oregon	10	187,000	Unknown	Unknown	Unknown
	(10)	(250)	(50)	(0)	(0)
Pennsylvania	5	581,000	Unknown	Unknown	Unknown
	(5)	(250)	(50)	(0)	(0)
Rhode Island	0	48,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(100)	(0)
South Carolina	5	216,000	Unknown	Unknown	Unknown
	(5)	(250)	(50)	(0)	(0)
South Dakota	0	16,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Tennessee	0	424,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Texas*					

State	Rural			Urban	
	Private		Public		
	Large corporate	Other private	Public, non-federal	Private	Public
East	5	130,000	Unknown	Unknown	Unknown
	(5)	(250)	(50)	(100)	(0)
West	0	482,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(100)	(0)
Utah	0	379,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Vermont	0	161,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Virginia	0	536,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
Washington	10	178,000	Unknown	Unknown	Unknown
	(10)	(250)	(50)	(0)	(0)
West Virginia	5	185,000	Unknown	Unknown	Unknown
	(5)	(250)	(50)	(0)	(0)
Wisconsin	5	419,000	Unknown	Unknown	Unknown
	(5)	(250)	(50)	(200)	(0)
Wyoming	0	87,000	Unknown	Unknown	Unknown
	(0)	(250)	(50)	(0)	(0)
American Samoa	Unknown	Unknown	Unknown	Unknown	Unknown
	(0)	(0)	(0)	(0)	(0)
Federated States of Micronesia	Unknown	Unknown	Unknown	Unknown	Unknown
	(0)	(0)	(0)	(0)	(0)
Guam	Unknown	Unknown	Unknown	Unknown	Unknown
	(0)	(0)	(0)	(0)	(0)
Marshall Islands	Unknown	Unknown	Unknown	Unknown	Unknown
	(0)	(0)	(0)	(0)	(0)
Northern Mariana Islands	Unknown	Unknown	Unknown	Unknown	Unknown
	(0)	(0)	(0)	(0)	(0)
Palau	Unknown	Unknown	Unknown	Unknown	Unknown
	(0)	(0)	(0)	(0)	(0)
Puerto Rico	Unknown	Unknown	Unknown	Unknown	Unknown
	(0)	(0)	(0)	(0)	(0)
U.S. Minor Outlying Islands	Unknown	Unknown	Unknown	Unknown	Unknown
	(0)	(0)	(0)	(0)	(0)

**The eastern and western portions of Texas and Oklahoma are treated as separate strata by the Forest Inventory and Analysis forest statistical estimation procedures and therefor, they are treated as separate strata for the National Woodland Owner Survey.

In addition to the base sample indicated in table B-1, 27 states indicated interest in conducting intensified surveys in their states. The number of states in which intensification occurs will ultimately depend on funding, but it could result in as many as 2,250 additional responses per year.

In addition to the 600 urban ownerships listed above, an additional 500 urban ownerships are anticipated to be contacted. The states of in which these additional contacts will happen depend on if and where the Forest Inventory and Analysis program decides the next urban areas that will surveyed and this has yet to be determined as it is dependent on funding allocations and other issues.

Up to 34 focus groups will be conducted over the 3-year sampling period. The number of focus groups increased from the previous iteration of the survey because we are using new survey instruments to more thoroughly test populations (urban, corporate, public, Pacific and Caribbean Islands, and science modules), and we want to ensure the surveys are comprehensively tested. The locations will be distributed across the United States with the intent to fully test the science modules and urban survey instruments, and to do qualitative research in the Caribbean and Pacific Islands. For the science module focus groups, two topics/modules would be addressed in each focus group session. Each focus group will consist of eight participants for a total of approximately 272 focus group participants over the three-year period. We will also conduct no more than 30 cognitive interviews. No additional interviews will be conducted once no additional information is being gleaned. These qualitative efforts will increase the number of respondents by approximately 302.

Expected Response Rates: The target response rate is 80+ percent. During the last iteration of the NWOS, the national response rate was just over 45 percent. Methods for increasing response rates and testing for non-response bias are described below.

2. Describe the procedures for the collection of information including:

- **Statistical methodology for stratification and sample selection,**
- **Estimation procedure,**
- **Degree of accuracy needed for the purpose described in the justification,**
- **Unusual problems requiring specialized sampling procedures, and**
- **Any use of periodic (less frequent than annual) data collection cycles to reduce burden.**

All of the statistical procedures have been peer-reviewed and have been published in *USDA Forest Service, National Woodland Owner Survey 2011-2013: Design, Implementation, and Analytical Methods* (USDA Forest Service Gen. Tech. Rep. in process) and *Methods for Estimating Private Forest Ownership Statistics: Revised Methods for the USDA Forest Service's National Woodland Owner Survey* (Journal of Forestry 111(5): 319-325). The statistical procedures have not changed from the previous iteration of the NWOS.

STATISTICAL METHODOLOGY

The sampling design is, technically speaking, a spatially tessellated and temporally systematic, disproportionately stratified, with-replacement, and probability proportional to size sampling design. First, each state is divided into non-overlapping hexagons. In rural areas, the hexagons are approximately 6,000 acres in size. An interwoven panel design is used to distribute the sample evenly over the sample period. Within each hexagon, a sample point is randomly placed. The land use/cover at this point is determined using remotely sensed data. If the point is forested, the owner of the underlying land is identified using tax records or other public sources. The sample point is then assigned to one of the strata described above. In states where the base sample is insufficient or the sample is intensified as part of the state intensification process, the size of the hexagons is reduced to generate the desired number of respondents. In census-defined urban areas, analogous sampling procedures are used, except that the size of the hexagons is adjusted to generate the desired number of respondents.

ESTIMATION PROCEDURES

To account for the sampling design described above, the following population and variance estimators are used. These are further detailed in *USDA Forest Service, National Woodland Owner Survey 2011-2013: Design, Implementation, and Analytical Methods* (USDA Forest Service Gen. Tech. Rep. in process) and *Methods for Estimating Private Forest Ownership Statistics: Revised Methods for the USDA Forest Service's National Woodland Owner Survey* (Journal of Forestry 111(5): 319-325).

Ownership-based Totals

The number of ownerships within a given stratum and domain of interest (e.g., the number of ownerships with a written forest management plan) can be estimated by:

$$\widehat{N}_{hd} = \frac{\widehat{A}_{FIA}}{n_h} \times \sum_{i=1}^{n_h} \frac{d_i}{a_i} = \widehat{A}_{FIA} \times \overline{x} \qquad (1)$$

Where

$\widehat{N}_{hd}$ = number of forest and other wooded land ownerships in stratum *h* and domain *d*,

$\widehat{A}_{FIA}$ = area of forest and other wooded land in the stratum, derived from FIA data,

n_h = number of sample points owned by survey respondents in the stratum,

d_i = an indicator taking the value of 1 if ownership *i* is in domain *d* and 0 otherwise,

a_i = area of forest and other wooded land owned by ownership *i*, and

$\overline{x} = \sum_{i=1}^{n_h} \frac{d_i}{a_i} / n_h$.

The variance of this statistic can be estimated by:

$$\widehat{var}\left(\widehat{N}_{hd}\right) = \widehat{A}_{FIA}{}^2 \times \widehat{var}\left(\overline{x}\right) + \overline{x}^2 \times \widehat{var}\left(\widehat{A}_{FIA}\right) \qquad (2)$$

Where

$$\widehat{var}\left(\overline{x}\right) = \frac{\sum_{i=1}^{n_h} \left(x_i - \overline{x}\right)^2}{n_h\left(n_h - 1\right)}$$

Ideally, a covariance term would be included in equation 2, but it is not estimable with the available data.

Acre-based Totals

The number of forested acres within a given stratum and domain of interest can be estimated by:

$$\widehat{A}_{hd} = \frac{\widehat{A}_{FIA}}{n_h} \times \sum_{i=1}^{n_h} d_i = \widehat{A}_{FIA} \times \overline{x}^a_{hd}$$

Where

$\widehat{A}_{hd}$ = area of forest and other wooded land in stratum *h* and domain *d*,

$\widehat{A}_{FIA}$ = area of forest and other wooded land in the stratum, derived from FIA data,

n_h = number of sample points owned by survey respondents in the stratum,

d_i = an indicator taking the value of 1 if ownership *i* is in domain *d* and 0 otherwise, and

$\bar{x}_{hd}^{a} = \frac{1}{n_h} \times \sum_{i=1}^{n_h} d_i$ and is equivalent to the sample proportion of points associated with responding family forest ownerships which are in the domain of interest.

The estimator of the variance of this total estimator is:

$$\widehat{var}\left(\hat{A}_{hd}\right) = \hat{A}_{FIA}{}^{2} \times \widehat{var}\left(\bar{x}_{hd}^{a}\right) + \bar{x}_{hd}^{a\,2} \times \widehat{var}\left(\hat{A}_{FIA}\right) \quad (4)$$

Where

$$\widehat{var}\left(\bar{x}_{hd}^{a}\right) = \frac{\sum_{i=1}^{n_h}\left(x_i - \bar{x}_{hd}^{a}\right)^2}{n_h\left(n_h - 1\right)}$$

DEGREE OF ACCURACY

The target sample size for rural private owners with small land holdings is a minimum of 250 in a state. Examining the coefficients of variation for the estimated numbers of ownerships from the previous iteration of the NWOS, the values approach an asymptote of approximately 0.15 at a sample size of about 250 and hence our target sample size. Samples sizes beyond this number allow us to ask additional questions and to provide meaningful sub-state level estimates. Similar accuracies are sought for other strata, but a current lack of data on population size and coefficients of variation make calculations not possible.

UNUSUAL PROBLEMS

No unusual problems requiring specialized sampling procedures will be used.

PERIODIC DATA COLLECTION

No ownership is asked to respondent more than once every five years, so periodic (less frequent than annual) data collection methods are not needed.

3. Describe methods to maximize response rates and to deal with issues of non-response. The accuracy and reliability of information collected must be shown to be adequate for intended uses. For collections based on sampling, a special justification must be provided for any collection that will not yield "reliable" data that can be generalized to the universe studied.

To maximize the response rates, we follow the standard methods described in *Internet, Phone, Mail, and Mixed-mode Surveys: The Tailored Design Method* by D. Dillman, J. Smyth, and L. Christian in order to establish trust, increase rewards, and reduce social costs. Part of the trust comes from the fact that the NWOS is conducted by a federal agency. We try to enhance this trust by stressing the importance and confidentiality of their answers in our interactions with them. To increase rewards, we highlight the specific uses of the data collected and the fact that they are a part of a statistical sample and their answer represents many other woodland owners. To reduce social costs, we have developed a questionnaire that is as short as possible, easy to understand, and contains no sensitive questions.

Survey implementation will include a pre-notice, a first copy of the questionnaire with a cover letter, a reminder notice, and a second questionnaire with a cover letter. First, a pre-notice letter will be mailed to all potential respondents describing this information collection – why we are doing it and why we need their help. Second, the potential respondents will receive a questionnaire with a cover letter. The cover letter will reiterate the purpose and importance of this information collection and provide the respondents with all legally required information. Third, a reminder will be mailed to thank the

respondents and encourage the non-respondents to respond. For those who have not yet responded, they will receive a second questionnaire and cover letter. Telephone interviews will be attempted for respondents who did not respond to previous contact. To reduce burden on respondents, respondents will be able to choose between hardcopy and electronic versions of the questionnaire. In addition to the self-administered questionnaire, other survey methods will be tested in some urban areas, such as face-to-face surveys and leaving door hangers with quick response (QR) codes.

Tests will be conducted to assess if non-response biases are present. These tests will include those outlined by the Federal Committee on Statistical Methodology Workshop's *How to do Nonresponse Bias Analyses in Household and Establishment Surveys* and the tests prescribed in publications, such as Groves et al.'s *Survey Nonresponse*. For example, early vs. late (e.g., mail vs. telephone) responses will be compared. In addition, we will use data collected as part of the sample frame (e.g., acres of land owned) and other external data sources to test for non-response biases. These tests have been conducted on previous iterations of the NWOS and no significant biases have been found, but we will continue to look and continue to refine our detection techniques. If a significant non-response bias is detected, statistical estimates will be adjusted appropriately. The specific adjustment procedure used will depend on the type and severity of bias, but could include post stratification, weighting based on auxiliary data, and/or imputation.

4. Describe any tests of procedures or methods to be undertaken. Testing is encouraged as an effective means of refining collections of information to minimize burden and improve utility. Tests must be approved if they call for answers to identical questions from 10 or more respondents. A proposed test or set of tests may be submitted for approval separately or in combination with the main collection of information.

Many of the questions and procedures used have been tested as part of previous iterations of the NWOS. In addition, we are proposing to conduct focus groups and cognitive interviews as part of this iteration of the NWOS to further test the survey instruments and refine our understanding of the responses.

5. Provide the name and telephone number of individuals consulted on statistical aspects of the design and the name of the agency unit, contractor(s), grantee(s), or other person(s) who will actually collect and/or analyze the information for the agency.

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