National Woodland Owner Survey (NWOS) Meeting

September 12, 2019

Co-sponsored by:
Society of American Foresters and
National Council for Air and Stream Improvement

WHY HOLD THIS MEETING?
SAF and NCASI have long been co-conveners of national users group meetings about the Forest Inventory and Analysis (FIA) program of the USDA Forest Service. Through these meetings, the broad and diverse community of natural resources professionals who depend on FIA data have helped the FIA program better meet the information needs of clients and stakeholders in the forest sector and society-at-large. The National Woodland Owner Survey (NWOS) is a component of the FIA program. At the April 2019 FIA National Users Group meeting, one of the recommendations was to hold a separate meeting focused on the current NWOS. Users wanted to take a fresh look at the current survey approach and how the data are analyzed and reported.

GOAL OF THE MEETING:
To provide feedback to FIA program leaders about improvements in the NWOS that would yield information of greater value to clients and stakeholders.

PRE-MEETING BRIEFING PAPERS:
To help provide a more consistent foundation of understanding about NWOS, seven briefing papers were prepared and sent to registered attendees ahead of the meeting:

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Topic: History and Timeline of Private Forest Landowner Surveys in the U.S.

Issue: Review the beginnings of landowner surveys in the United States that were part of census programs and the evolution to surveys by the Forest Service’s Research & Development mission area and others.

Background on Censuses

Decennial censuses are the most credible source of information on population demographics and economic activity of the United States. The Secretary of State was responsible for conducting the censuses from the first one in 1790 until 1849, when the responsibility shifted to the Department of the Interior. Censuses were run as special projects without permanent staff until Congress enacted legislation creating a permanent Census Office within the Department of the Interior. In 1903, the Census Office was moved to the newly created Department of Commerce and Labor. It remained within Commerce when Commerce and Labor were split into separate departments in 1913.

Decennial censuses originally began as surveys of households to determine population and demographics (e.g., ages and genders of family members, free or slave, etc.). But by 1820, the census questions began to diversify and expand. Census questions aimed at businesses and manufacturers were added as separate “schedules” (folio of questions). In 1840, a schedule of questions specifically for farmers was created, called the Census of Agriculture. The Census of Agriculture continued as part of the Census Bureau for 157 years until the 1997 Agriculture Appropriations Act shifted it from the Dept. of Commerce to the Dept. of Agriculture, who assigned it to the National Agricultural Statistics Service (NASS).

Landowner surveys were not new to NASS. They had been collecting crop production data based on independent annual samples of farmer and rancher activities and issuing reports since 1842. The Bureau of the Census had managed additional farm and landowner surveys over the years, including the Farm and Ranch Irrigation Survey and the Census of Horticultural Specialties. The Census Bureau also administered the Agricultural Economics and Land Ownership Survey to gather more specific data from a sample of farms that reported in the Census of Agriculture. The responsibility for these special projects also shifted to NASS along with the Census of Agriculture and NASS continued them, the latter one in partnership with the Economic Research Service (ERS).

Milestones in Census Surveys of Landowners and Manufacturers

- **1840 Census** marked the beginning of the Census of Agriculture by including a few questions about agricultural activities—area of farmland, crops produced, and livestock. The schedule of questions—Census of Manufacturing—also asked manufacturers questions related to forest products, including value of lumber produced, barrels of naval stores, tons of wood ashes (for lime and potassium fertilizer), skins and furs, ginseng, paper manufactured, and number of people employed.
• **1870 Census.** The first use of the term “woodland” in Schedule 3—Agriculture. Woodland was broken out as a component of “Unimproved” land in the census of farmers. Before 1870, Unimproved land was tallied without being subdivided into two components.

• **1880 and 1890 Censuses.** The number of questions about forests increased dramatically—to 160 by 1880. Details went beyond the Agriculture Schedule and Manufacturing Schedule to include many forest- and wood-related questions, including the prevalence, extent, and causes of forest fires, and how wood harvested from forests utilized, either by the landowner (e.g., for fence posts and rails, for fuel on the farm or ranch) or by mills and manufacturers (a dozen use categories; e.g., cooperage, chemicals, lumber, leather tanning).

• **1925 & 1930 Census of Agriculture.** The Census of Agriculture narrowed its focus to farms and ranches. It asked farmers and ranchers to report how much of their woodland was simultaneously used for grazing (“woodland pasture”) and how much of their woodland that wasn’t grazed. However, both types of woodland had to be clearly linked to the core business of farming or ranching. Timberlands that were separate businesses—even if owned by farmers or ranchers—were excluded. Further, owners of forest land who were not farmers or ranchers were not surveyed in the Census of Agriculture. But some of these properties were identified through the Census of Manufacturers.

• **1959 Census of Agriculture.** The report attempted to clarify the confusion surrounding its data for woodlands that were part of a farm or ranch enterprise and the area of forests and woodlands reported by others. The authors of the 1959 report acknowledged that the acreage of woodland reported does not include all the privately-owned forest land in the U.S.: “The total woodland and forest land amounts to 593 million acres and includes 93 million acres of woodland and forest land pastured and grazed and 500 million acres not pastured or grazed. Woodland in farms totals 164 million acres while woodland and forest land not in farms totals 429 million acres. The 593 million acres of woodland and forest land do not include forest land in parks, wildlife refuges, etc.”

  o The Forest Service (FS) reported that the nation had 753 million acres of forest land in 1953. The difference between the census report and the FS report—160 million acres—was an estimate of the forest in public ownership—federal, state, and local.

**Milestones in Department of Agriculture Surveys of Landowners and Land Uses**

• **1927.** McSweeney-McNary Act directed the Forest Service (FS) to inventory all U.S. forestland; whether publicly or privately owned.
  o Private forest land included land owned by companies, mills, farms, ranches, and other non-governmental organizations, such as hunting clubs.
  o Public forest land included federal, state, county, and local government lands.
  o This 1927 Act was amended in 1947 to authorize periodic remeasurements
  o This authority overlapped the Census of Agriculture’s authority, but it was much broader, aiming to cover all forests in the U.S.
• The Soil Conservation Service (SCS) had been conducting “Conservation Needs Inventories (CNIs)” on private lands to identify soil erosion and related issues. In 1958, it renamed the CNI program the “natural resource inventory” (NRI) program.
  o SCS and the FS recognized their overlapping interests in conducting inventories on land with trees and the authorization the 1927 McSweeney-McNary Act that gave to the FS for conducting inventories on all forest land—both publicly and privately owned—in the nation.
  o Intra-departmental negotiations settled the overlap issue—along the same “boundary” that had historically been used in the decennial census (i.e., Improved versus Unimproved land). If land with trees yielded annual harvests of “crops,” such as fruit and nut orchards, or the trees were young and highly cultivated, such as Christmas tree plantations or nurseries raising trees for landscaping, that land was not considered “forest” and remained in the SCS-NRI and the Census of Agriculture. All other land with trees was deemed “forest” and the FS was responsible for inventory and reporting on its area, condition and trends—even when the forests occurred on farms or ranches.

• **1960 and 1965.** To augment data from the periodic Censuses of Agriculture, the USDA Economic Research Service (ERS) began limited surveys on private landownership and private landowners’ economic activity. The ERS surveys expanded in their detail in 1970, 1978, and 1988. Some data on forests owned by farming and ranching interests were gathered and summarized by ERS.

• **Present.** NASS is still conducting surveys of both farm operators (the U.S. Census of Agriculture) and owners of farmland (who may or may not be the farm operators). These latter efforts are part of their Tenure, Ownership, and Transition of Agricultural Land (TOTAL) survey efforts.

**Milestones in Forest Service Landowner Surveys**

Beginning in the 1950s, the FS published many of the basic studies on nonindustrial private forest landowner (NIPF) characteristics and continues doing such studies. In their study of “small private forest-land holdings in 23 New England towns” Barraclough and Rettie (1950) were among the earliest that reported on how the forest properties were acquired, length of ownership, and the owner’s occupation, age, and residence. Their study also listed distribution of the forest land by size of forest holding—a characteristic would prove to be significant in later research. It also discussed financial returns as an important factor in why individuals owned forest land. Although some studies from the mid-1950s came from the California Forest and Range Experiment Station, by the 1960s, scientists from the FS research stations in the northeastern part of the United States emerged as leaders in landowner surveys—not surprising because that’s where the majority of the non-industrial private forest landowners were located, and still are today.

In 1952, the FS began preparing a comprehensive review of the nation’s timber resource situation; this was the first major assessment since an abbreviated study in 1945 that took stock of the situation immediately following World War II. Preliminary results were released in 1955; final results in 1958. Josephson and McGuire (1958) analyzed the timber situation by landownership type (public/private and industry/farm/other), size of ownership, hardwood/softwood, and stand size (sawtimber, pole timber, seedlings and saplings, nonstocked; as surrogates for age and marketability). They reported demographic information for farm and other private landowners and connected the demographics to forest productivity, management activities, and opportunities to improve productivity and management.
Josephson and McGuire concluded that,

“In appraising the problems and opportunities for future timber supplies, it is evident that farm and miscellaneous private ownerships are of first importance. They represent 61 percent of all commercial forests. Because of their extent, potential productivity, and location with respect to markets, these lands should be expected to provide the greater part of the Nation’s future timber needs. This will require solution of difficult problems, however. Most of these ownerships are of small size, productivity of recently cut lands is relatively low, and for various reasons management efforts are limited or lacking” (p. 314).

Josephson and McGuire’s findings set the tone for FS landowner surveys for the next 10-15 years and influenced university research.

This table from Butler et al. (2016) chronicles the set of national-scale FS landownership surveys; today called the National Woodland Owner Survey (NWOS). The “Date” shown in the first column is the year when data were collected. The core reports are shown in the “Reference” column.

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- **1970s-1980s.** Many FS landowner surveys were conducted at the state-level. Examples include Kingsley (1975), Kingsley and Birch (1977), Carpenter and Hansen (1985), and Carpenter et al. (1986). State foresters were very interested in these state-level surveys and how the findings related to contemporary state issues. The state-level reports all drew on FIA data.
  o Landowners who had FIA plots on their land were surveyed, connecting the landowner survey data to statewide forest resource inventory results.
  o Connecting the landowner survey to the FIA field plot sampling design allowed FS analysts to estimate total acreage owned by ownership size classes (Kingsley 1975).
  o The surveys identified landowner interests beyond timber (Brooks and Birch 1986).

- **1982.** First report of national scope on private forest landowners, from the FS in collaboration with ERS (Birch, Lewis, and Kaiser 1982). Lewis, an ERS researcher, provided summaries of 1978-1979 ERS landowner survey data.
  o Estimated 7.8 million ownerships held 333 million acres of private U.S. forestland
  o Almost half of private forestland was in ownerships larger than 500 acres, owned by less than 1% of ownership units
  o Corporations, large partnerships, and estates owned 34% of the forestland, double the 16% owned by farmers
  o Regional and sub-regional, but not state-level, breakdowns were included for variables including form of ownership; owner’s occupation, age, sex, race, residence, and education; and size class of ownership.

- **1993.** FIA conducted its first national survey of private landowners (Birch 1996).
  o Private forest landowners were classified into four groups for analyses.
    - Individual ownerships, including joint husband and wife and family ownerships other than family corporations
Partnerships
Corporate ownerships
Other private landowners, including undivided estates, trust, clubs and associations, and Native American tribes

Demographics, owner objectives, timber harvesting behavior, and management planning experience were all reported by ownership class and size of land holding.

**Late 1990s.** The late 1990s were a time of major transitions for the FIA program. It would be another decade before another national survey of private landowners. Three key things happened:

- A spirited debate over FIA program content and priorities inside and outside the FS led to major program changes in the FIA program’s focus, external relationships, and sampling design and estimation procedures.
  - The FIA program decided to move from a periodic to an annualized inventory program. Costs and benefits of the shift were documented in USDA Forest Service (1998), and subsequent strategic plans (USDA Forest Service 2007 and 2016). To provide more transparency about the sampling design and estimation procedures, a technical report was prepared that underwent widespread and detailed peer review (Bechtold and Patterson 2005).
  - A Service-wide Memorandum of Understanding (SMOU) with the National Association of State Foresters cemented the agreement that landowner trends were a vital part of the FIA program and that regular surveys of landowners as part of the FIA program were essential to meet both FS and state forester information needs.
- A key FS decision was to integrate fresh data from landowner surveys with the decennial natural resources assessments required under the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA) (16 U.S.C. §§ 1600 et seq.). This affected the timing of future national private landowner surveys.
- Two Blue Ribbon panels were organized by FIA program clients and stakeholders in 1991 and 1998. Their recommendations to agency leaders (www.fia.fs.fed.us/library/bus-org-documents) emphasized the importance of making regular surveys of private forest owners.
  - The untimely demise of Thomas W. Birch, who had led the landowners survey work within the FIA program for two decades, meant finding a new leader.

**2002-2006.** FIA’s second national survey of private landowners. Data for this second national survey were collected over a four-year period.

- Butler et al. (2005) presented the sampling design, estimation procedures, and analytical framework for this survey. That document was fully peer-reviewed prior to publication.
- Butler (2008) presented the analytical results, which were published as an RPA Assessment technical report and incorporated into the 2010 RPA Assessment. Advice about comparing results of this survey with previous ones and important clarifications about definitions are presented on page 3 of the report. For details, see https://doi.org/10.2737/NRS-GTR-27. Two critical points were:
  - **Definition of “forest.”** Global dialogues about inconsistent definitions of “forest” from the early 1990s to 2000 led to international agreement on a new definition. The FIA program adopted the new definition and used it in stratifying land cover between “forest” and “nonforest” categories. “Land at least 10 percent stocked by forest trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. The minimum area for classification of forest land is 1 acre.”
Ownership category definitions. Consultations between FIA program leaders and a broad array of clients and stakeholders for FIA information led to new definitions of landowner categories ("Private Owner Sub-Group Codes-Section 2.5.9. in FIA Core Data Field Guide") in a two-phase classification. Phase 1 was type of ownership, by 5 sub-categories. Phase 2 was whether the landowner owned or operated a wood-using plant (tallied “1” if Yes, “0” if No).
- 41. Corporate, including Native Corporations in Alaska and private universities
- 42. Non-governmental conservation/natural resources organizations. Examples are The Nature Conservancy, National Trust for Private Lanes, Forest Trust, Boy Scouts of America, etc.
- 43. Unincorporated partnerships/associations/clubs. Examples are hunting clubs that own, not lease, property, recreation associations, churches, 4H groups
- 44. Native American (Indian), within reservation boundaries
- 45. Individual and Family, including trusts, estates, and family partnerships
- In the graphic, above, "Industrial" ownerships are private lands (codes 41 to 45) where the landowner owns or operates a wood-using plant.
- In the graphic above, “Family” are owners coded 43 (Unincorporated partnerships/associations/clubs) or 45 (Individual and Family)
- In the graphic above, “Other non-industrial” are owners coded 41 (Corporate,), 42 (NGOs) or 44 (Native American)

What Censuses of Agriculture had historically excluded—lands owned by manufacturers ("Industrial")—continued not to receive private landowner surveys. But some of the land and owners that Censuses of Agriculture had historically excluded—woodland and forest owned by farmers and ranchers that was not directly supporting the farming or ranching activity, and forest land owned by individuals and groups who were not farmers or ranchers (e.g., individuals and families engaged in other occupations or groups (e.g., hunting clubs, land conservation trusts)—were now eligible to be included in the 2002 to 2006 NWOS survey. The new definition of “Family” that was introduced after the consultations was “families, individuals, trusts, estates, family partnerships, and other unincorporated groups of individuals that own forest land.”

NWOS sent questionnaires to all non-industrial owners (coded 41-45), then sorted and reported results by two categories: “Family” (codes 43 and 45) or “Other Private” (codes 41, 42, and 44) categories. See for example, Table B in Butler 2008 (https://doi.org/10.2737/NRS-GTR-27).

Although industrial owners did not receive the private landowner surveys, their land was included in the FIA program’s forest inventory and monitoring activities.
• **2011-2013.** The next national landowner survey gathered data during these three years. Because of differences in sampling methods and questionnaire content, comparisons of results from surveys in 1990s are limited. The 2006 and 2013 iterations were the first to use the same sampling and estimation methods and the 2013 questionnaire was designed to have many comparable elements to allow for assessments of change.
  o Following publication of results from the previous survey (Butler 2008), several researchers published critiques of the sampling design and estimation procedures (Metcalf 2010 and Metcalf et al. 2012; the latter appearing in a peer-reviewed journal). Dickenson and Butler (2013) responded to the critique, in the same peer-reviewed journal.
  o Butler et al. (2016a) presented the design, implementation, and estimation procedures for this survey iteration.
  o Butler et al. (2016b) reported results from the 2011-2013 survey. A more detailed report by Butler et al. (2016c) presented results for private landowners having more than 10 acres. Results for family forest ownerships with 1-9 ac holdings were published separately (Butler and Snyder 2017).
  o Individual two-page state summaries about landowners with 10 or more acres were circulated; an example for Georgia is Butler and Butler (2016).

• **2017-2018.** This marks the final “periodic” NWOS iteration. The methods and content were largely identical to the 2011-2013 iteration. During this period, initial work was started on two new landowner survey efforts: the National Urban Landowner Survey and the National Landowner Survey of Large Forest Ownerships.
  o **National Urban Landowner Survey (NULS):** As the FIA program expanded into urban areas, the ownership survey was directed to do likewise. This survey is aimed at residential landowners in selected urban areas across the U.S. whose city governments have chosen to participate in the FIA program’s field data collection activities. Data collected are related to land and ownership characteristics, management activities, sources of information, and general attitudes towards trees. The NULS was pilot tested in Austin, TX and multiple cities in Wisconsin. The initial full-implementation was in 2018 in Baltimore and it is now expanding as local officials invite the FIA program into additional cities.
  o **National Landowner Survey of Large Forest Ownerships (NLSLFO):** Given the diversity of private forest ownerships, it is not possible to create survey instrument that is optimized for all of them. As an initial attempt to address this issue, a pilot survey of large corporate landowners was conducted in 2018. Caputo et al. (2016) analyzed FIA plot and survey data and identified 45,000 acres as a threshold for identifying “large” ownerships. Results from the pilot study will be used to develop the next iteration of the NLSLFO.

• **2019 and beyond.** Following the lead of the plot-based portion of the FIA program, the NWOS is transitioning to an annualized implementation approach. The goal is to complete a full-cycle of surveys every 5 years. Full reports will be published at 5-year intervals and annual updates will, eventually, also be available.

**Milestones in Other Private Forest Landowner Studies**

Many other researchers at universities, in state agricultural experiment stations, and elsewhere have published results of private forest landowner surveys and those results have been summarized in
extensive bibliographies (e.g., Carpenter and Davis 1982, Franklin et al. 1985, Hodgdon et al. 2011, Straka 2011).

**Straka (2011)** includes over 400 citations that cover many of the major nonindustrial private forest or family forest studies, from early to current, and classifies them both by themes used by other authors and categories that relate to major research areas in the current literature. By developing a taxonomy that classified the studies by research objective, methodology, owner motivation, and problem definition, Straka’s article served to organize the family forest literature into three phases that provide a clearer timeline to better understand the historical motivation for and development of family forest research in the United States.

- Straka noted that initial surveys in the 1800s and until the late 1970s focused on landowner demographics, with limited information about how wood from their land was being utilized by themselves and nearby manufacturers.

- By 1980, the focus of private landowner research had shifted to whether owners were practicing the forest management (and timber sale) activities necessary to support local manufacturers. The underlying force driving this shift was the perception that “the problem” with NIPF ownerships was a timber supply problem (e.g., Binkley 1981). Researchers sought to understand how timber production might be increased and what incentives (e.g., technical assistance, financial assistance) might be needed.

- A second focus area emerging in the 1980s was timber markets and marketing of stumpage. What did landowners know about local timber markets, timber prices, and timber sale practices? What imperfections existed in local or regional timber markets? Lack of knowledge about these matters put landowners at a significant disadvantage compared to timber buyers in what many landowners viewed as a very complex timber sales situation. Creating landowner-friendly knowledge bases and transparent price-reporting systems, along with the importance of hiring consulting foresters to create management plans and administer timber sales, were policy recommendations emerging from many of these surveys on timber marketing.

- Since 2000, much of the private landowner research has studied NIPF landowner motivations in terms of incentives or disincentives impacting forest management on their land. An excellent example of this work for the southern U.S. is Wear and Greis (2013).

Outstanding examples of dialogues that seek to move beyond research findings to actions that help increase sustainable forest management on private lands are recounted in the notes from the 2003 and 2006 Wingspread Conferences (Sustaining Family Forests 2003 and 2006).

**Summary**

- Surveys of forest landowners continue to be very important to a wide range of clients (users of FIA data), stakeholders (groups whose interests are affected by the data and results), and public officials responsible for setting forest-related policies and implementing forest-related
programs. Interests today are different than interests in prior years when data were collected by the Census Bureau and other USDA agencies. Landowner surveys have evolved in response to changing interests and the increasingly diverse community of interests.

- Clear understanding of survey results and the sampling design and estimation procedures that generate them is vital to proper interpretation and use of the published data. Over the past 20 years, the National Woodland Owner Survey, as well as the broader FIA program, has experienced a significant increase in peer-review, especially related to its sampling design and estimation procedures. This review has improved the understanding of analysts, clients, stakeholders, and officials inside and outside the FS.

Frequently Asked Questions about NWOS are at: https://www.fia.fs.fed.us/nwos/faq/.

NWOS data are made available to scientists outside the FS for their use in analyses customized to their own information needs and institutional objectives. Privacy concerns and safeguards are needed for federal datasets like the NWOS, and the program has developed policies and ways that enable others to access NWOS data. Consult the FIA Customer Service Desk (https://www.fia.fs.fed.us/tools-data/customer-service/index.php) for help in accessing FIA data or for assistance in using it. The FIA Spatial Data Services Center is also available to help generate customized data sets for outside analysts (https://www.fia.fs.fed.us/tools-data/spatial/index.php)

References


Pre-Work Briefing Paper
National Woodland Owner Survey Meeting

Topic: Partnership between the National Association of State Foresters and the FIA Program

Issue: The partnership between NASF and the Forest inventory and Analysis (FIA) program has existed since the beginning of FIA program field work in the early 1930s. Since then, there have been several reports and memoranda of understanding between NASF and the FS regarding the FIA program. There has been consistent, long-term support by state foresters for the FIA program, increasingly well-documented since the early 1990s.

Introduction

The National Association of State Foresters (NASF) was organized in 1920. In the 1920s and 1930s, core issues were the role of private lands in meeting the nation’s timber supply needs, how to improve reforestation on private lands, how to bolster the important role of forested watersheds, and how to enhance protection of private lands from fires and pest outbreaks. Central to all these issues was the need for a better understanding of private landowners’ motivations and interests. Despite a different set of priorities during World War II, NASF returned to these core issues in the 1950s—sustainable timber supplies and forest protection. But new interests were growing—the role of private forests in providing wildlife habitat and opportunities for outdoor recreation. Surveying private landowners to understand their motivations and interests began with state-level questionnaires in the 1950s and expanded during the 1960s and 1970s. Individual state foresters were supportive of these studies, largely conducted either by university or Forest Service (FS) researchers, because the results helped them formulate more effective state-level technical assistance and educational programs (e.g., Birch and Pywell 1986 “Communicating with nonindustrial private forest landowners: getting programs on target” (https://www.fs.fed.us/ne/newtown_square/publications/research_papers/pdfs/scanned/OCR/ne_rp593.pdf)

The early state-level landowner survey work by FS researchers were all closely connected with individual State Forester’s local interests. Further, the individual state-wide landowner surveys were all tied to state data from the Forest Inventory and Analysis (FIA) program. Landowners who had FIA plots on their land were sent mail questionnaires asking questions about their forest land, why they owned it, and how they were managing it. The connection between the FIA field sampling design and plot data and the mail questionnaire survey results was critical to developing estimates of total acreage owned by ownership size classes and landowner interests beyond timber production. These early results from FS landowner surveys in the 1970s and 1980s and their tight linkage to FIA field plot data were a key reason why NASF support for the FIA program was strong and growing stronger over time.

NASF has been both a strong proponent of FIA as well as an advocate for program change, and it has used organizational resolutions in 1995, 2004, 2009, and 2015 as a means of demonstrating both. NASF Resolution No. 2004-4 called attention to the need for development of an urban inventory component of the FIA program. NASF Resolution No. 2009-6 encouraged the USFS to seek funding to fully implement FIA nationwide; seek funding to enhance FIA on developing issues such as climate change, carbon, land use changes, water resources, biomass, and bio-energy; and enhance the FIA program. NASF Resolution 2015-06 laid out its strategic vision and priorities for the program through 2020.
Blue Ribbon Panels

By the late 1980s, FIA clients and stakeholders were getting frustrated. Forest conditions were changing at an accelerating pace, time periods between inventories were growing, federal forests were not being inventoried by the FIA program, and FIA data were being used for purposes beyond estimating timber availability and supplies, such as wildlife habitat assessments.

First Blue-Ribbon Panel. Intense and widespread interest in data about the U.S. forests led in 1992 to the convening of the First Blue Ribbon Panel on the Forest Inventory and Analysis program (1BPR). NASF was one of the leading groups supporting creation of 1BPR. Panel members included high-level leaders from the full forestry community, including Federal and State agencies, industry, environmental organizations, academia, and other user groups. Their mission was to develop a national vision and strategy, as well as goals and objectives, for meeting the present and future needs for forest inventory information. 1BPR developed eight recommendations for action and met with FS and Congressional leaders to urge their implementation.

1. Improve and expand information on ecosystems and non-commodity values
2. Recognize and identify ownership, regulatory, and social impacts on forest productivity
3. Produce the most current resource data possible
4. Implement a uniform approach on all ownerships
5. Increase consistency and compatibility among FIA units
6. Enhance coordination between FIA and public agencies
7. Improve service to user groups
8. Expand clientele

In response, the FIA program prepared A Blueprint for Forest Inventory and Analysis Research and Vision for the Future. It discussed many of the topics 1BPR recommended and listed more than two dozen commitments that, taken together, would improve the FIA program. One of the commitments was, “Update the national survey of forest land owners of the United States.” This commitment, responding directly to the second recommendation, was directed specifically at gaining a better understanding of private forest landowners’ motivations and interests. It led to the first national survey of private forest landowners in 1993 by Tom Birch, a FS researcher at the Northeastern Forest Experiment Station. He reported results in 1996.

Second Blue-Ribbon Panel. Increasing concerns about the limited progress made on the 1BPR recommendations and Blueprint commitments led FIA clients and stakeholders to convene the Second Blue Ribbon Panel (2BRP) in 1997. Like 1BPR, panel participants represented the full diversity of interests in the forest community. The objective was to assess progress and chart a course for further action. 2BRP made 5 broad recommendations and several more specific comments:

1. Elevate the priority of the FIA program within the FS and the R&D mission area
2. Initiate an annual inventory process that gathered some data in each state every year and develop the supporting infrastructure, data compilation, and analysis capacity to handle it
3. Fulfill the FIA program’s legislative mandate to inventory and report on all forest land
4. Concentrate on core ecological and timber data
5. Develop a five-year strategic plan that laid out how these and the 1BPR recommendations would be implemented, along with the costs and organizational changes needed.
Specific comments dealt with the program’s management structure, funding level, coordination and cooperation, merger of the forest health monitoring program with FIA, use of remote sensing, data management practices, core variables to measure and report on, and links to sustainable forestry criteria and indicators.

Within these comments was an emphasis on recognizing and identifying ownership, regulatory, and social impacts on forest productivity. 2BRP urged the FS to “institutionalize the recently completed forest ownership study at an interval of ten years, and implement a follow-up survey concentrating on practices and plans of industry landowners.” The FS was also urged to look at related variables, including tract size, operability, and to conduct “… special studies and reporting on emerging issues that are deemed important.”

**Strategic Documents and Vision Statements**

**1999 FIA Strategic Plan.** The recommendations of 2BRP were embodied in § 253 of the Agricultural Research, Extension, and Education Reform Act of 1998 (Public Law 105-185), enacted June 23, 1998. The strategic plan called for in the Act was submitted to Congress in 1999 and a congressional hearing was held on its contents. All the persons who testified about the strategic plan had participated in 2BRP. The strategic plan called for continuing the surveys of forest landowners and timber products manufacturers (timber products output survey). The strategic plan also outlined closer working relationships with State Foresters, especially in the field plot data collection phase. State foresters conducted detailed reviews of several drafts of the strategic plan that helped to better focus and improve the plan.

To provide greater openness and transparency in its operations, the FIA program began publishing annual business summaries. Like corporate annual reports, the summaries described highlights and accomplishments in the preceding year and set out promised actions for the coming fiscal year that would move the program forward as outlined in the strategic plan, and recounted the promises made the previous year and how they were fulfilled. Of special importance to NASF were appendices that: (1) provided very complete and detailed income and expenditure information; (2) supporting activities, and their cash value, provided by state foresters to deliver the program; (3) and grants and agreements with universities, NGOs, and state forestry agencies to collect, analyze, and report FIA information. Annual business summaries continue to be prepared. NASF and Congressional staff believe that these summaries are among the best annual accountability reports by any federal agency for a program.

To build stronger and closer relationships between FIA program leaders and key clients and stakeholders, NASF took three steps. First, NASF co-led efforts to showcase the value of the program within the Administration and Congress. Second, NASF strongly supported creation of a National FIA Users Group when SAF and NCASI stepped forward as co-conveners. Third, the regional associations of state foresters appointed lead points-of-contact for regional FIA units. These POCs not only participated in regional meetings with station FIA leaders, they also represented their regional associations’ interests during the annual National FIA Users Group meetings. That close involvement regionally and nationally has been critically important to the advances and successes of the FIA program over the past 20 years.

**The 2007 FIA Strategic Plan** took stock of program advancements and proposed further changes to better respond to changing forest conditions and emerging issues. Again, NASF and its regional associations and points-of-contact brought much expertise to establishing near-term goals, objectives,
and the path forward. One of the plan’s key recommendations was to convert the National Woodland Owner Survey from a periodic survey conducted once every 10 years to an annual survey, where questionnaires would be mailed to all the owners of land where FIA or state field crews had collected plot data the preceding year. In this way, the views, attitudes, and aspirations of the landowner could be more closely and directly tied to the plot conditions and measurements taken by the field crews.

The 2015 FIA Strategic Plan was developed in response to §8301 of the Agriculture Act of 2014 (Public Law 111-88), which required the FS to address the organization, procedures, and funding needed to achieve 11 elements specified in the Act. This plan laid out the “next-generation” FIA program’s objectives and components. Three of the elements directly affected state forester interests:

- Engage State Foresters and other users in reevaluating the list of core variables;
- Foster greater cooperation among agency leaders, State Foresters, and other users of FIA information; and
- Expand existing programs to promote sustainable forest stewardship through increased understanding of the over 10 million family forest owners, their demographics, and the barriers to forest stewardship.

Again, NASF members worked closely with agency leaders in developing and reviewing approaches to improve the program, many of which would require commitments of state agency money, personnel, and other in-kind support to achieve the objectives. The first two strategic plan options (A and B) called for continuing NWOS to determine the goals and objectives of private forest landowners and to summarize the survey results to inform policy decisions at the State and county levels. Option C called for enhancing NWOS to determine the goals and objectives of timber investment management organizations (TIMOs) and real estate investment trusts (REITs) and to improve online tools for accessing NWOS data so users could do their own analyses. Higher-cost options called for additional commitments of non-federal resources to intensify sampling and other FIA activities. Presently, FIA program funding for FY 2019 is at the Option B level, but by wringing out some additional program efficiencies from other activities, the dollars saved are being applied to certain elements in Option C, such as beginning work to expand NWOS to include TIMOs and REITs.

2015 State Forester Strategic Vision and Priorities for the Forest Inventory and Analysis Program.

The intent of this NASF strategic vision document is twofold (https://www.stateforesters.org/wp-content/uploads/2018/08/2015-06-NASF-FIA-StrategicVision.pdf). It is intended to highlight the value of the FIA program to State Foresters and the public across a range of disciplines, from forest health to economic development. However, it is also intended to recognize the contribution of State Foresters to the success of the program and highlight their vision for the program into the future. NASF is in a unique position with respect to FIA program delivery, as the only partner contributing significant dollars to collecting and analyzing data nationwide (the FIA strategic plan shows an average of $7 million annually by member states from FY 2001 to FY 2013).

Ensuring continuity for the current NWOS survey protocol is part of the Strategic Vision’s Priority 1 – Fully Fund and Implement a Comprehensive and Adequate Base Program. NASF strongly supports a continued federal/state partnership in NWOS.

The third level of priority in the Strategic Vision includes expansion of NWOS. As part of this effort, NASF believes that NWOS should incorporate all private owners, not just family forest owners, and that NWOS data should be collected and reported on an annual basis. In this document, NASF supported the
FS proposal for the next iteration of the NWOS, which began implementation in 2017, and includes new science modules in addition to the opportunity for state-level intensifications and customizations. This new iteration is also the first to feature expansion into urban forest areas and survey instruments specifically tailored for corporate owners. States have the opportunity to partner with the NWOS to increase the number of respondents in their states beyond the federally funded base-level, allowing for more refined data and statistics for sub-state areas as well as state-specific questions.

Memoranda of Understanding Between the NASF and the FS

Two additional examples of NASF’s long-term support for the FIA program are the two MOUs they have with the FS.

**2000 MOU.** The purpose of this agreement was to establish a general framework for cooperation between NASF and the FS in implementing the FIA program changes that flowed from the direction contained in the Agriculture Research, Extension, and Education Reform Act of 1998. NASF committed to appoint State Foresters or their representatives to participate in the appropriate organizational levels of the FIA program, act as a clearinghouse to help disseminate information about the FIA program to all State Foresters and to other interested partners, as appropriate; encourage State Forester members to provide resources needed to enhance the base federal FIA program, and to cost share to deliver the full FIA program envisioned by the Agriculture Research, Extension, and Education Reform Act of 1998 (PL 105-185), assuring that all allowable cost sharing be recognized; and encourage State Foresters or their representatives to participate in annual regional user group meetings.

**2017 MOU.** The purpose of this agreement was to update the previous MOU, accounting for the new elements in the Agricultural Act of 2014 and the evolving state-federal partnership. NWOS was the second core element recognized in this MOU. The MOU called for NWOS information to be made available annually and analyzed and reported for each State every five years. It continued the commitments of NASF and State Foresters to participate in meetings, act as a clearinghouse for information, and provide resources needed to support the federal/state partnership important to delivering the program.

Summary

Since 1920, NASF has been a strong advocate of bringing forth the best possible information from forest inventories about changing forest conditions and landowner attitudes. Core to NASF’s advocacy has been supporting the development and evolution of a strong, nationally-consistent FIA program, including regular surveys of forest landowners as a core component of the program. NASF members have made and lived up to their commitments to provide money, personnel, and other in-kind support to the FIA program to accelerate progress and provide better information for all those who depend on the nation’s forest resources for the things they value. NASF has been relentless in seeking additional resources to the FIA program and pushing for them to be used as efficiently as possible. NASF members are at the forefront of delivering services to private landowners. Thus, NASF highly values the NWOS because its information is critical to member tailoring of technical assistance and educational programs to meet the diverse needs of state residents—whether they own less than 10 or more than 10,000 acres.
Topic: Origin and Evolution of the Term “Woodland” in Censuses

Issue: The usage of the term “woodland” has a long history in decennial censuses and censuses of agriculture. This paper reviews the origin of the term and how it evolved over 150 years.

Introduction

Decennial censuses are the most credible source of information on population demographics and economic activity of the United States. Until 1849, the Department of State was responsible for implementing decennial censuses. Responsibility for conducting censuses shifted to the Department of the Interior in 1850, and stayed there until 1903 when the year-old Bureau of the Census was shifted to the Department of Commerce and Labor. When this department was divided into two, the Bureau of the Census remained in the Department of Commerce, where it still resides today.

Census Data About Woodland in 19th Century Censuses

1840 Census. The 1840 Census was the first one with specific questions about agriculture. Each household was asked how many family members were employed in agriculture. Each farm family was asked to describe the agricultural crops produced—what and how much. This set of questions was the beginning of what eventually became the Census of Agriculture. A separate schedule of questions for manufacturers had a section on forest products. Its questions asked the value of lumber sawn, barrels of naval stores, tons of wood ashes (for lime and potassium fertilizer), skins and furs trapped, ginseng and other medicinal plants harvested, paper manufactured, and number of people employed in each firm.

1850 Census. This was the first census with a separate schedule (folio of questions) on agriculture, composed of 19 sections with 46 questions, that were used to interview farmers. The first section started with questions about the farm’s land. Farmers were asked to distinguish between “Improved” land versus “Unimproved” land.

- **Improved land** was defined as “cleared and used for grazing, grass, or tillage, or which is now fallow, connected with or belonging to the farm.”
- **Unimproved land** was defined as “land connected to the farm, not necessarily contiguous to the improved land, but may be a wood lot or other land some distance but owned in connection with the farm, the timber or range which is used for farm purposes.”
- This is the first time that the term “wood lot” was used by the census. The definition made two crucial distinctions. First, the wood lot need not be contiguous with the improved land; part of the same parcel. Second, the wood lot had to generate products essential to the core agricultural purpose of the farm, such as fuelwood for home heating, fence posts, saw logs that provided lumber for constructing farm buildings, or understory vegetation used for livestock grazing.
**1870 Census.** This was the first census to use the term “woodland.” Woodland was broken out as a component of “Unimproved” land in Schedule 3--Agriculture. The definition of “Improved” land was the same as in 1850, but additional examples were given to enumerators that illustrated land with trees that were being deliberately cultivated for fruit, nuts, or seedlings or nurseries growing trees were included in the Improved category.

Woodland was defined as land with trees that was not included in the Improved category. The key element of the definition that distinguished Improved from Unimproved land was that Unimproved land had never been cleared and plowed—essential antecedents to farming.

Part of the report on the 1870 Census was the first map of woodland in the United States, developed by William Brewer, Professor of Agriculture at Yale and later Professor of Forestry. Prior to joining the Yale faculty, Brewer was a technical expert involved in biological reconnaissance of western forests.

> The map showing the distribution of woodlands relates to areas merely. It exhibits the relative proportions of surface occupied by woodlands and by lands not occupied by trees, so far as the scale chosen will allow, it takes no account of the species which make up the tree-covering of the soil, nor of the density of the forests—that is, of the relative numbers of trees per acre—nor of their size or economic value, or their fitness for sawing or other use or manufacture. The census of 1870 returned the number of acres of "Woodland" and the number of acres “improved” and "unimproved other than woodland" in each turn. The ratio of woodland to other land in farms, was calculated for each county, and made the first basis for the map. (https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5397694.pdf)
**1880 Census.** The agriculture schedule was expanded to 25 sections with 100 questions. Land tenure questions were asked for the first time. The census instructions also expanded and clarified on how to classify Improved and Unimproved land. Permanent meadows, pastures, orchards and vineyards were classified separately from other tilled land in the Improved category. In the Unimproved definition, the category named “Woodland” in 1870 was renamed “Woodland and Forest.”

The report on the 1880 Census showed 190,255,744 acres of Woodland and Forest. The report also discussed the difference between the total estimated land area of the United States (1,856,108,800 acres) and total area in farms (536,081,835 acres), to help readers understand what kinds of other land uses are not covered in farm land area:

This difference is made up of many items. These are the sites of buildings and the grounds connected with them, whether isolated or in villages or cities; there is the space covered by public highways, canals, and railroads; there are the tracts of land owned by non-residents or by persons who are not farmers. In this latter class of lands is even included a vast extent of pasturage and woodlands, especially the latter. In some states the great body of forests is held by speculators or lumber-mill operators, who are not farmers in any sense of the term. … The total amount of land, improved and unimproved, reported as embraced in farms in 1880 was 536,081,835 acres, against 407,735,041 acres in 1870.

Several pages later, the report discussed forest wealth and forest products:

The value of forest products reported in 1880 was $95,774,735, against $36,808,277 in 1870. Of this it should be observed, however, that the products reported are those only which are obtained from the forest in connection with ordinary farm operations. As already stated, the census of agriculture is a farm census; and those lands which are owned and exploited by lumber speculators, saw-mill operators, and other persons not farmers, are by the terms of enumeration omitted from the account.

Among the items reported in this connection was 51,442,624 cords of wood cut on farms during the year 1879. This and all other items relating to the consumption of wood which were secured in the enumeration, whether on agricultural, the manufacturing, or the railroad schedule, have been placed for discussion in the hands of Professor Charles S. Sargent, director of the Arnold arboretum of Harvard University, and the special agent appointed under the act of March 3, 1829, to report upon the forest wealth of the country. Professor Sargent has made a most exhaustive investigation of this subject, the results of which will appear in a separate volume.

Sprague’s “Report on the Forests of North America (exclusive of Mexico) was published in 1884.
**Summary About 19th Century Censuses.** The review of census data from the 19th century revealed that the term “Woodland” was introduced in 1870, replacing the terms “Wood lot” and “Woodland and Forest.” The review also shows that the Woodland and Forest areas reported in census documents were restricted to the acreage on family farms that directly supported the agricultural enterprise. The nation’s total forest area was recognized as much larger.

**Census Data About Woodland on Farms in the 20th Century**

Data collection using the agriculture schedule was largely unchanged between 1890 and 1920. As the new Bureau of the Census got established in 1902-1903 and gained experience and as the pool of clients for the data expanded and diversified, some changes were made.

**1925.** The Bureau of the Census started a separate Census of Agriculture, on a five-year schedule. It expanded data collection by introducing eight different categories of land. Woodland had a new definition: “All land occupied by trees or young growth which has or will have value as wood or timber should be classified as woodland.” A total of 143.9 million acres of woodland were reported in 1925. Two sub-categories of woodland were reported:

- **Woodland pasture.** Defined as, “Woodland used for pasture at any time during 1924.” 76.7 million acres was reported.
- **Woodland not used as pasture.** Defined as, “All farm wood lots, natural or planted, and cut-over land with young growth, but excluding land having only chaparral or woody shrubs, that were not used as pasture in 1924.” 67.2 million acres was reported.

Note that these definitions made two significant changes from previous censuses in defining woodland. First, past censuses had not explicitly recognized that forests could be recreated by planting. The past assumption was that woodlands had been naturally created and were naturally regenerated. Secondly, cut-over forests with young growth were recognized as woodland. Old fields where cultivation had been abandoned that were in transition to tree cover—with trees established either through natural seeding or planting—were also included in woodland.

**1945 Census of Agriculture.** Enumerators were instructed, “… not to include in the farm data any large areas of timberland or other nonagricultural land held by an operator of a farm as a separate business, and not used for pasture or grazing, or for any other farm purpose. Sometimes there were sufficient agricultural operations on such holdings to meet the requirements of a farm. The enumerator in reporting these operations, occasionally included the entire tract rather than limiting the report to that acreage actually used for agricultural operations. In such cases, the excess acreage, if extreme (usually 1,000 acres or more), was deleted in the editing. In deleting these large acreages of woodland and other land, the requirements of the farm for pasture and for wood and timber were considered.”

**1959 Census of Agriculture.** The reports for the 1950 and 1954 censuses attempted to clarify that the area of woodland reported only included woodlots essential to farm operations. But the authors of the 1959 report acknowledged that the acreage of woodland reported does not include all the privately-owned forest land in the U.S.: “The total woodland and forest land amounts to 593 million acres and includes 93 million acres of woodland and forest land pastured and grazed and 500 million acres not pastured or grazed. Woodland in farms totals 164 million acres while woodland and forest land not in
farms totals 429 million acres. The 593 million acres of woodland and forest land do not include forest land in parks, wildlife refuges, etc.”

1978-1979. The first national-scale analysis of private forest landowners, drawn from survey data gathered by the Dept. of Agriculture’s Economic Research Service (ERS) in partnership with the Bureau of Census. The report (https://doi.org/10.2737/WO-RB-1) by a joint team of Forest Service (FS) and ERS researchers emphasized landowner demographics. An estimated that 7.8 million private ownerships held 333 million acres of forest land. Almost half was in ownerships larger than 500 acres, held less than 1 percent of the ownerships. Corporations, large partnerships, and estates owned 34 percent of the forest land, double the 16 percent owned by farmers. The survey questionnaire used “woodland” once (asking [Yes/No] whether any expenditures had been made in 1975-1977 in “clearing of brush or woodland for agricultural use?“) but did not define it.

Census Data About Woodland in Forest Surveys in the 20th and 21st Centuries

Researchers in the Forest Service, at universities, and in some other organizations conducted state-wide or regional surveys of private forest landowners, starting after World War II. Following the interest created by the joint FS-ERS report, the FS laid plans to conduct more national surveys of private forest landowners.

During the late 1990s and early 2000s, there was global dialogue, led by the United Nations Food and Agriculture Organization (FAO) about how to describe and define the term “forest” compared to a different term for other land with trees. FAO produces global forest resources assessments every five years, providing a consistent approach to describing the condition and extent of the world's forests and how they are changing. The FAO definition of “forest” was agreed to early in the dialogue, but how to classify land with trees outside of “forest” land remained a problem. For the 2010 Global Forest Resource Assessment, FAO published a document entitled Towards the Assessment of Trees Outside Forests (https://www.fao.org/docrep/017/aq072/aq072e00.pdf) that included definitions for “Trees outside forests (TOF)” and “Other wooded land (OWL).” TOF were trees in urban or agricultural land uses. OWL was land that had 5-10% tree canopy cover and met all other aspects of the “forest” definition. The FS decided to integrate estimates of OWL into the RPA Assessment reports, but renamed it “woodland.”

- “Woodland” was defined as land at least 120 feet wide and at least 1 acre in size with sparse trees capable of achieving 16.4 feet in height—in situ—with a tree canopy cover of 5 to 10 percent combined with shrubs a least 6 feet in height to achieve an overall cover of greater than 10 percent of woody vegetation. The definition includes all areas recently having such conditions and currently regenerating or capable of attaining such condition in the near future. It does not include land that is predominantly under agricultural or urban land use.
- “Forest” was defined similarly—having the same minimum width, area, and other conditions—but with tree canopy cover greater than 10 percent. Forest tree species are expected to have a height exceeding 12 feet at maturity¹ (National Core Field Guide ver. 8.0, p. 288).

1 Although the Field Guide did not explicitly state that the minimum height at maturity must be achieved in situ—on the specific site and ecological conditions where the plot was located—and not elsewhere in the range of the species, that was certainly implied and is necessary to conform to the international definition. The 12-foot minimum height is left over from earlier field guides that preceded the UN-FAO definitions. For some unknown reason, changing the Field Guide’s minimum height definition from 12 feet to the 16.4-foot international standard has been overlooked in recent revisions since 2010.
1994 Private Forest Land-owners of the United States. The second national survey gathered data in 1994 and published the results in 1996 ([https://doi.org/10.2737/NE-RB-134](https://doi.org/10.2737/NE-RB-134)). The report’s abstract said, “Nearly half the private forest land is in ownerships with greater than 500 acres of forest. Nearly half of the owners have harvested timber from their holdings at some time in the past. Owners have a positive attitude toward timber cutting at a time where there is greater demand for products from the forest. Interest in harvesting the timber resource has created a situation in which watchful monitoring and good stewardship will be needed to maintain the productivity of ecosystems for future generations.”

This report, as well as earlier ones conducted by the FS, used the term “forest land” in the reports, but the survey instruments themselves used the term “woodland” The term was not defined in the survey instruments, but was presumably assumed to be synonymous with the term forest land.

2002-2006 National Woodland Owner Survey (NWOS). The FS gathered fresh data over a four-year period. Potential NWOS questions and terms were pre-tested to evaluate the receptivity of potential respondents to the terms used and their ability to understand and answer the questions. The pre-test showed that potential respondents were more receptive to the term “woodland” than alternatives to describe their land with trees and using “woodland” promoted understanding of the questions. The term “woodland” was now defined in the survey instrument: “Land at least one (1) acre in size, 120 feet wide, and has at least ten (10) well-spaced trees per acre, and land at least one (1) acre in size, where trees were removed and trees will grow again (not converted to another use, such as cropland, pasture land, or residential) Woodland does not include Christmas tree farms, orchards, or nurseries or land that is mowed for lawn.”

- Butler et al. (2005) reported the sampling design, sample population, and estimation methods to be used in NWOS ([https://doi.org/10.2737/NE-GTR-336](https://doi.org/10.2737/NE-GTR-336)). The sample population was clearly and directly tied to the FIA program’s phase 2 plot locations. The NWOS sampling design was a
“Probability Proportional to Size” (PPS) design, meaning that the more acreage a landowner had, the higher the probability that they would be sampled.


**2008 Federal Geographic Data Committee (FGDC) National Vegetation Classification Standards.** The FGDC was established in 1990 to promote consistent terminology and definitions for geospatial information at all levels of the U.S. government; federal, state, and local. After the UN-FAO reports defined forests, trees outside forests, and other wooded land, the FGDC developed a second-generation national vegetation classification standard in 2008, (FGDC-STD-005-2008) that attempted to improve alignment and consistency of U.S. geospatial terms and definitions with the UN-FAO work. The new FGDC standard presented a new definition of “tree” and laid out a detailed, hierarchical system to classify overstory and understory vegetation (https://www.fgdc.gov/standards/projects/vegetation/NVCS_V2_FINAL_2008-02.pdf). The new standard required the FIA program and RPA reports to reclassify portions of what FIA previously called “forest” into a class called “woodland.” It also returned chaparral to the RPA statistics as “woodland”; chaparral had been removed in 1997 because it didn’t meet the minimum standards for forest land in use at that time. The FGDC standard said, “Given the wide overlap in use of the terms Forest and Woodland, we used both terms to indicate that the class definition encompasses all mesomorphic (i.e. broad-leaved or needle-leaved) trees of varying height and canopy spacing” (page 40) and that future RPA and FIA reports will begin to more fully populate and describe three new classes: woodland; urban treed land; and other land with woody vegetation.

**2011-2013 National Woodland Owner Survey (NWOS).** The 2013 NWOS used the term “woodland” on the survey instrument, defined identically to the 2002-2006 survey, and the term “forest land” when reporting results. The use of the term “woodland” has been corroborated with subsequent research, such as Andrejczyk et al. (2016) (http://dx.doi.org/10.5849/jof.14-151), who found that private landowners highly prefer the term “woods” over ‘forests.”

**2012 Forest Resources of the United States: a Technical Report for the 2015 Resources Planning Act (RPA) Assessment Update.** Authors of the 2012 report responded to the 2008 FGDC new standard and the UN-FAO new definitions. They decided to classify land whose vegetation met the UN-FAO definition of Other Wooded Land (OWL) as “woodland.”

- “Woodland” was defined as land at least 120 feet wide and at least 1 acre in size with sparse trees capable of achieving 16.4 feet in height with a tree canopy cover of 5 to 10 percent combined with shrubs a least 6 feet in height to achieve an overall cover of greater than 10 percent of woody vegetation. The definition includes all areas recently having such conditions and currently regenerating or capable of attaining such condition in the near future. It does not include land that is predominantly under agricultural or urban land use.
- “Forest” was defined similarly—having the same minimum width, area, and tree height and other conditions—but with tree canopy cover greater than 10 percent.
- Oswalt et al. (2012) reported the nation had 766.2 million acres of forest and 52.6 million acres of woodland that fit these definitions (https://doi.org/10.2737/WO-GTR-91). Some authors have added the two to report that the U.S. has 819 million acres of forest and woodland.
Forest Resources of the United States, 2017: A Technical Document Supporting the Forest Service 2020 RPA Assessment. (https://doi.org/10.2737/WO-GTR-97). The authors said that “FIA defines woodland strictly along the lines of species composition and associated forest types, and considers woodlands a subset of forest lands. ... Although woodlands will typically have less crown cover than traditional forests, they must meet the minimum crown cover threshold (10 percent) to be included in FIA forest and woodland estimations.” (Pages 13-14). Table 1-1 lists the nine FIA forest types eligible for classification as woodlands, and notes that the majority stocking on a woodland plot must be from one or more of the 38 woodland tree species listed in Table 1-2. Finally, trees must have a root collar diameter of 5 inches or larger to be tallied.

However, the authors proceed by saying that the RPA definition of woodlands differs from the FIA definition of woodlands. The RPA definition of woodland uses the same tree species as the FIA definition, but has additional conditions:

- Classified as one of the nine FIA-defined woodland forest types
- Having a site productivity level of less than 20 cubic feet per acre per year
- Located in one of nine ecological provinces: Colorado Plateau Semidesert Province; Southwest Plateau and Plains Dry Steppe and Shrub Province; Chihuahuan Semidesert Province; American Semidesert and Desert Province; Great Plains Steppe Province, Intermountain Semidesert and Desert Province, and Intermountain Semidesert Province
- Having an average tree height less than 16.4 feet.

Table 1-3 provides a stark example of the difference in woodland estimates between the FIA definition and the RPA definition. The report states that the United States has 57 million acres of woodlands (RPA definition), with Texas having the most (22 million acres or 39 percent of the national total).

2017-2018 NWOS. The 2018 NWOS was mailed to all private landowners of forests or woodlands; using the FIA definition of those two terms. The core of the NWOS program remains focused on understanding rural private forest owners. Most of these are families and individuals, but non-profit organizations, smaller corporations owning less than 45,000 acres, and other rural property owners with forests or woodlands (FIA definition) are also included. The NWOS activity has also developed two additional components. One is large corporate owners who own more than 45,000 acres and a different survey instrument for urban landowners in cities that are part of the Urban FIA program.

Summary

There were few changes in the definition of woodland used in Censuses of Agriculture in the 19th and 20th Centuries. The changes that were made served to refine the term—focusing on lands with trees
whose products were an important component of the farm or ranch enterprise. More recently, such as in the 1959 survey report, woodland area on farms was described in the broader context of the nation’s privately-owned forests. The term is still be used on the current iterations of the Censuses of Agriculture. The 1978-1979 survey used woodland as a generic synonym for forest land. The 1994, 2002-2006, 2011-2013, and current NWOS carefully define the term at the beginning of the survey booklet.

The NWOS uses woodland in its title because pre-testing of questions with landowners showed that the landowners understood it best, could easily relate to it, and were receptive to it. Although woodland is the term used in the questionnaire, reports based on NWOS always use the term forest land rather than woodland when describing results. The NWOS sample population and sampling design remain tied to the FIA program’s phase 2 sampling design for forest land.

The new woodland definitions and classes introduced by the UN-FAO documents, the 2008 FGDC standard, and revised definitions introduced in FIA and RPA program documents over the past decade are not synonymous with earlier definitions of woodland used in decennial censuses or the Census of Agriculture. The RPA definitions, initially reported in Oswalt et al. (2012) and used again in Oswalt et al. (2019), appear aligned more closely with international definitions used by UN-FAO in monitoring and reporting on global forest resource conditions. The FIA definition appears aligned more closely with land cover definitions espoused by the FGDC and traditional domestic FIA clients and stakeholders. This difference in woodland definitions between FIA program and RPA program documents should be recognized by analysts and readers to avoid confusion or erroneous conclusions during temporal and/or spatial analyses of forest and woodland data. Authors using the term woodland should carefully define it in their publication to minimize confusion among readers.
**Pre-Work Briefing Paper**

**National Woodland Owner Survey Meeting**

**Topic:** Protection of Landowners’ Privacy in the FIA Program, including the NWOS

**Issue:** Landowners are sometimes reluctant to grant access to their land for FIA field plot measurements or to respond to FIA surveys, such as the National Woodland Owner Survey (NWOS). The FIA program has specific authorities and procedures for protecting the privacy of landowners who participate in the program. This paper outlines several authorities and procedures used.

**Introduction**

In 2000, the Department of the Interior and Related Agencies Appropriations Act (H.R. 3423, § 348) amended the Food Security Act of 1985 (H.R. 2100) to include the USDA Forest Service’s Forest Inventory and Analysis (FIA) program in a list of activities that may not make data available to the public if the owner of the land on which the data were collected can be identified (7 U.S.C. 2276 (d), attached). Penalties for violating the law can include fines up to $10,000 and/or a year in jail. In recognition of the fact that two-thirds of the forest land in the United States is privately owned and of the importance of private landowner participation in the FIA program, FIA was placed under the same privacy protection provisions as other critical agricultural inventory, monitoring, and census programs operated by the National Agricultural Statistical Service (NASS). A new privacy law was not created for FIA. Rather, Congress gave private forest landowners participating in the FIA program the same legal protections already enjoyed by farmers participating in the other USDA programs.

**Impetus for Legislative Authority to Protect the Privacy of FIA Program Participants**

What stimulated this push for privacy protections? There were two instances in the late 1990s that moved Congress to give the FIA program additional authority to protect privacy.

- During another federal agency’s botanical survey of private lands in California, a listed plant species on the federal Threatened, Endangered, and Sensitive (TES) species list was discovered. Although the private landowner had voluntarily given that agency permission to conduct the botanical survey on the property, after discovering the TES species the agency attempted to require the private landowner to take certain mitigation and protection actions that the landowner felt impinged on their property rights. The case proceeded to court. Other California landowners became aware of the situation through media reports and began to refuse the FIA program permission to visit plots and collect data on their property, significantly raising the “Denied Access” percentage (non-response rate) and ultimately the statistical precision and accuracy of FIA data for California. Concerned about this situation and its potential for eroding trust and credibility of the FIA program, several NGOs appealed to Congress to provide clearer protections for private landowners who voluntarily participate in the FIA program.

- A state who had a severance tax that required private landowners to pay a percentage of timber sale receipts in exchange for lower annual property tax payments, asked the FIA program to provide a list of all landowners on whose FIA field plots the FIA field crews recorded timber harvested since the last measurement. The state wanted to cross-reference the owners who had harvested timber with the list of owners paying severance taxes to evaluate compliance with the severance tax policy and bill those who hadn’t paid. The FIA program refused to
provide the list of landowner names. Again, FIA program supporters were concerned about the FIA program becoming an enforcement arm of a state taxation agency and that this request singled out FIA program participants for enforcement compared to other landowners who were not part of the sample drawn.

**What Prevents FIA Confidential Data from being Requested under the Freedom of Information Act (FOIA)?**

Since 1967, the Freedom of Information Act (FOIA) has provided the public the right to request access to records from any federal agency. Federal agencies are required to disclose any information requested under the FOIA unless it falls under one of nine exemptions which protect interests such as personal privacy, national security, and law enforcement. Three of these exemptions, exemption 3, 4 and 5, in conjunctions with statute 7 U.S.C. 2276 (d), protect FIA confidential data, including plot location in both public and private lands, private personal identifiable information, and confidential business information such as mill data.

As an extra precaution to ensure data confidentiality, FIA has recently adopted the practice of including language referring to FOIA exemptions in all new legally bidding agreements, including Memorandums of Agreement (MoA) between FIA and other federal agencies, material transfer agreements (MTA), and material transfer research agreements (MTRA). These agreements also protect FIA plot coordinates from being reverse engineered.

**FIA Program Implementation of Privacy Protections**

To protect the privacy of all property owners or managers who voluntarily participate in the FIA program and the confidentiality of the information they provide, all raw FIA data—including NWOS data—are not publicly available. After data are compiled and quality assurance and quality control checks are completed, the publicly-available online database is updated with information that preserves the privacy and confidentiality of landowners.

The FIA program has had ongoing consultations with the Census Bureau and NASS since the mid-1990s over practices for protecting respondents’ privacy and for creating digital products from which users cannot infer information from individual landowners. The practices employed by all three agencies have been thoroughly researched and tested for efficacy and documented in the peer-reviewed literature.

**Keeping Plot Coordinates Confidential.** Because FIA plots are geo-referenced using a global positioning system (GPS) and ownership maps are freely available to the public in county tax offices, making public the plot data with geospatial coordinates is tantamount to revealing the owner’s name and thus violating the law. A privacy policy was adopted by the Forest Service (Forest Service Handbook Directive 4809.11-2005-1) regarding the FIA program with the goal of protecting the privacy of private forest landowners who allow FIA field crews to collect data on their property. The policy ensures that data for any plot cannot be linked with certainty to the participating private landowner.

In addition to addressing legal concerns, maintaining privacy of the plot locations is essential to FIA’s mission for two important reasons.
• **Maintaining voluntary access to private property.** Permission to collect data on private lands is vital to the continued credibility of the FIA program. Accuracy of data on trends and changes depend on remeasuring the same plots over time. Owners are concerned about how the data collected on their land are being used and who has access to it. They also need to know that they are shielded from all regulatory or taxation issues. Finally, FIA wants to reduce the nuisance factor of having strangers seeking to visit plots on their property.

• **Preserving normal ecological conditions.** If the plot location were freely available, individuals could either intentionally or unintentionally alter conditions on the plot, impacting the integrity of data collected at the next time remeasurement (in 5 to 10 years). There are two aspects.
  
  o There have been situations where landowners who know the plot location have intentionally, but mistakenly, altered land management on and around FIA plots (e.g., if thinning the stand, avoiding the plot instead of treating it the same as the surrounding area). Plot confidentiality helps assure that the management of the plot area is typical of surrounding lands.
  
  o Understory vegetation composition and density are vital components of forest inventory and health monitoring data. Multiple plot visits can adversely affect understory vegetation, again, degrading the quality of future remeasurement data. Because the FIA program has no control over access to sample locations, the best way to protect the location and on-plot ecological conditions is to keep the plot locations confidential. This is the primary consideration for plot confidentiality on public lands.

**Facilitating Spatial Analyses of FIA Data.** The FIA program wants to assist users in conducting geospatial analyses of FIA data, yet at the same time protect landowner privacy. To reach this objective, FIA developed a technique whereby the plot coordinate data in the publicly accessible online database are slightly altered (fuzzed) and some of the plot data are exchanged (swapped). The purpose of fuzzing and swapping is to maintain the functional spatial value, or “ecological signal” of the data while introducing enough uncertainty to decouple the plot-landowner relationship.

  • “Fuzzing” consists of randomly relocating most plot latitude and longitude coordinates within one-half mile of their actual coordinates, with the remainder relocated up to 1 mile. This means that the actual plot location is generally masked within a 500-acre area.

  • “Swapping” consists of exchanging the plot coordinates for a small number of similar plots within the same county. Swapping only occurs on private forested plots and depends on the region of the country. Between 0 and 10 percent of the forested plots are randomly selected for swapping with plots from the remaining data for a total swapping of between 0 and 25 percent. The primary criterion for swapping is based on a measure of ecological similarity. Plots with the smallest ecological difference are swapped. The variables for swapping—e.g., x and y coordinates, forest type group, and stand size—vary by region. This induces enough uncertainty as to the actual property owner to satisfy the legal requirements without introducing an unacceptable amount of error in the population estimates computed for analyses.

Prior to implementing fuzzing and swapping, the FIA program convened a series of discussions with technical experts from the Census Bureau and NASS about the available options for protecting the identity of landowners who voluntarily participate in the FIA program. Fuzzing and swapping emerged as the best approach that balanced privacy concerns with providing useful geospatial information to outside users. For a substantial majority of the types of analyses that outside users want to do, the fuzzed and swapped data yield no significant difference in results (see Guldin, Scott, and King (2005))
For those lines of research or analysis where the scientist believes that use of the actual plot coordinates is essential, they can request help from the FIA program’s Spatial Data Services Regional Coordinators (https://www.fia.fs.fed.us/tools-data/spatial/requests/index.php). The coordinators can process the request and create a product for the scientist that is cleansed of all landowner information.

Summary

The FIA program has implemented practices that protect the privacy of individual landowners who voluntarily allow FIA field crews to collect data on their property and who participate in mail surveys, such as the NWOS. These practices balance the rights and interests of private landowners with the program’s objective of serving clients and stakeholders in the program.
7 United States Code 2276. **Confidentiality of Information** ([https://www.law.cornell.edu/uscode/text/7/2276](https://www.law.cornell.edu/uscode/text/7/2276))

(a) **In general** in the case of information furnished under a provision of law referred to in subsection (d), neither the Secretary of Agriculture, any other officer or employee of the Department of Agriculture or agency thereof, nor any other person may—

1. use such information for a purpose other than the development or reporting of aggregate data in a manner such that the identity of the person who supplied such information is not discernible and is not material to the intended uses of such information;
2. disclose such information to the public, unless such information has been transformed into a statistical or aggregate form that does not allow the identification of the person who supplied particular information; or
3. in the case of information collected under the authority described in paragraph (12) or (13) of subsection (d), disclose the information to any person or any Federal, State local, or tribal agency outside the Department of Agriculture, unless the information has been converted into a statistical or aggregate form that does not allow the identification of the person that supplied particular information.

(b) **Duty of Secretary; immunity from disclosure; necessary consent**

1. In carrying out a provision of law referred to in subsection (d), no department, agency, officer, or employee of the Federal Government, other than the Secretary of Agriculture, shall require a person to furnish a copy of statistical information provided to the Department of Agriculture.
2. A copy of such information—
   
   A shall be immune from mandatory disclosure of any type, including legal process; and
   
   B shall not, without the consent of such person, be admitted as evidence or used for any purpose in any action, suit, or other judicial or administrative proceeding.

(c) **Violations; penalties**

Any person who shall publish, cause to be published, or otherwise publicly release information collected pursuant to a provision of law referred to in subsection (d), in any manner or for any purpose prohibited in section (a), shall be fined not more than $10,000 or imprisoned for not more than 1 year, or both.

(d) **Provisions of law references.** For purposes of this section, a provision of law referred to in this subsection means—

1. ..... 
10 section 3(e) of the **Forest and Rangeland Renewable Resources Research Act of 1978** ([16 U.S.C. 1642(e)](https://www.law.cornell.edu/uscode/text/16/1642#(e)));

11 ...
2.4.12 OWNCD
Owner class code. *Core for all accessible forest land; Core optional for other sampled land* A code indicating the class in which the landowner (at the time of the inventory) belongs. When PLOT.DESIGNCD = 999, OWNCD may be blank (null).

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>National Forest.</td>
</tr>
<tr>
<td>12</td>
<td>National Grassland and/or Prairie.</td>
</tr>
<tr>
<td>13</td>
<td>Other Forest Service land.</td>
</tr>
<tr>
<td>21</td>
<td>National Park Service.</td>
</tr>
<tr>
<td>22</td>
<td>Bureau of Land Management.</td>
</tr>
<tr>
<td>23</td>
<td>Fish and Wildlife Service.</td>
</tr>
<tr>
<td>24</td>
<td>Departments of Defense/Energy.</td>
</tr>
<tr>
<td>25</td>
<td>Other Federal.</td>
</tr>
<tr>
<td>31</td>
<td>State including State public universities.</td>
</tr>
<tr>
<td>32</td>
<td>Local (County, Municipality, etc.) including water authorities.</td>
</tr>
<tr>
<td>33</td>
<td>Other non-Federal public.</td>
</tr>
<tr>
<td>46</td>
<td>Undifferentiated private and Native American.</td>
</tr>
</tbody>
</table>

The following detailed private owner land codes are not available in this database because of the FIA data confidentiality policy. Users needing this type of information should contact the FIA Spatial Data Services (SDS) group by following the instructions provided at: [FIA Spatial Data Services (SDS)](http://www.fia.fs.fed.us/tools-data/spatial/).

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>Corporate, including Native Corporations in Alaska and private universities.</td>
</tr>
<tr>
<td>42</td>
<td>Non-governmental conservation/natural resources organization.</td>
</tr>
<tr>
<td>43</td>
<td>Unincorporated local partnership/association/club.</td>
</tr>
<tr>
<td>44</td>
<td>Native American.</td>
</tr>
<tr>
<td>45</td>
<td>Individual and family, including trusts, estates, and family partnerships.</td>
</tr>
</tbody>
</table>

Codes: OWNCD
2.4.13 OWNGRPCD
Owner group code. (Core for all accessible forest land; Core optional for other sampled land) A broader group of landowner classes. When PLOT.DESIGNCD = 999, OWNGRPCD may be blank (null).

Codes:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Forest Service (OWNCD 11, 12, 13).</td>
</tr>
<tr>
<td>20</td>
<td>Other Federal (OWNCD 21, 22, 23, 24, 25).</td>
</tr>
<tr>
<td>30</td>
<td>State and local government (OWNCD 31, 32, 33).</td>
</tr>
<tr>
<td>40</td>
<td>Private and Native American (OWNCD 41, 42, 43, 44, 45, 46).</td>
</tr>
</tbody>
</table>

2.4.14 FORINDCD
Private owner industrial status code. (Core for all accessible forest land where owner group is private; Core optional for other sampled land where owner group is private)

A code indicating whether the landowner owns and operates a primary wood-processing plant. A primary wood-processing plant is any commercial operation that originates the primary processing of wood on a regular and continuing basis. Examples include: pulp or paper mill, sawmill, panel board mill, post or pole mill.

This attribute is retained in this database for informational purposes but is intentionally left blank (null) because of the FIA data confidentiality policy. Users needing this type of information should contact the FIA Spatial Data Services (SDS) group by following the instructions provided at: http://www.fia.fs.fed.us/tools-data/spatial/.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Land is not owned by industrial owner with wood-processing plant.</td>
</tr>
<tr>
<td>1</td>
<td>Land is owned by industrial owner with wood-processing plant.</td>
</tr>
</tbody>
</table>

Codes: OWNGRPCD, FORINDCD
The USDA Forest Service Forest Inventory and Analysis (FIA) program is charged with monitoring the forest resources of the United States. This includes not just the biophysical resources, but also the social context within which the forests exist. To meet this need, FIA conducts national landowner surveys to generate information on: who owns the nation’s forests, why they own it, what they have done with it in the past, and what they intend to do with it in the future. Understanding these characteristics is critical for developing and delivering effective programs, policies, and services. This information is particularly important for implementing landscape-level, cross-boundary conservation practices. There are currently three landowner surveys being conducted: National Woodland Owner Survey, Urban National Landowner Survey, and Large Corporate Forest Landowner Survey.

**National Woodland Owner Survey**
- Target population: Private forest landowners across the U.S., excluding large corporate owners (see below).
- Target sample sizes: 250 responses per state.
- Topics: Ownership and land characteristics, ownership objectives, ownership history, forest use and management, recreational activities, sources of information, concerns, future intentions, and demographics.
- Methods: Up to four contacts per respondent. Mail is the primary contact method. Telephone interviews used to assess nonresponse bias. Participants randomly selected using an area-based sampling frame.
- Current status: Data have been published for the 2006 and 2013 iterations of the NWOS. Data for the 2018 NWOS are in the process of review for publication and are expected in fall of 2019. The NWOS began annual implementation in 2019 and reports will be published every five years.

**Urban National Landowner Survey**
- Target population: Residential landowners in selected cities.
- Target sample size: 100 responses per city.
- Topics: Ownership and land characteristics, green space use and management, neighborhood characteristics, program participation, sources of information, concerns, urban wood use, and demographics.
- Methods: Up to four contacts per respondent. Mail is the primary contact method. Telephone interviews used to assess nonresponse bias. Participants randomly selected using an area-based sampling frame.
- Current status: The UNLS was initiated in Baltimore in 2018 and expanded to included Austin, Denver, Houston, Portland, and St. Louis in 2019. Results for the 2018 Baltimore UNLS will be published in late 2019; results for other cities will be published in five-year cycles, unless data collection is intensified.

**Large Corporate Forest Landowner Survey**
- Target population: Corporations that own 45,000 or more acres of forest land in the U.S.
- Target sample size: All ownerships in the target population.
- Topics: Ownership and land characteristics, management objectives, management practices and planning, concerns, and community relations.
- Methods: Up to four contacts per respondent. Combination of electronic and mail contact methods. Telephone interviews used to assess nonresponse bias.
- Current status: Pilot study conducted in 2018 with results to be published in late 2019.

For more information, contact: Brett Butler, Principal Investigator, Northern Research Station. brett.butler2@usda.gov or visit www.fia.fs.fed.us/nwos
FLA Urges USFS Not to Overlook Core Forest Landowners in Critical Survey

Are core forest landowners falling in the gap among USFS NWOS surveys focused on small wood lot owners, urban tree owners and large-scale corporations?

Although the NWOS, released regularly since 1993, is the government’s most thorough assessment of family forest ownership in the United States, FLA believes the methodology and summary reporting inaccurately portray family forest landowners and forests. As a result, skewed information is disseminated to the media, NGOs, and policy makers, all of which accept it at face value.

The NWOS survey has driven both administrative decisions and conservation policy, and as a result has shaped public perception of family owned forests in America. FLA is concerned that the survey and its results are not an accurate depiction of forest landowners; rather it is a representation of small woodland owners.

To provide an unbiased review of the NWOS, the Forest Landowner Foundation hired Responsive Management Services and Chase Statistics to produce a technical review, assessing the methodology and reporting of the NWOS. The result of the assessment is a 40-page report detailing the findings and recommendations for future reporting on family forest landowners in America.

This report is a follow-up to “Narrative Gone Wrong,” diving deeper into how the statistics of family forest landowners generated from the NWOS are misleading in terms of what constitutes a forests, reasons for ownership, and management of the resource.

In addition, FLA recently completed its own survey of nearly 600 private forest landowners that more accurately portrays core family forest landowners, their management and reasons for ownership.

In February, 2019 FLA’s board of directors met in Washington with U.S. Forest Service Chief Vicki Christiansen and Jim Hubbard, USDA Under Secretary of Environment and Natural Resources, to advocate for better representation of core family forest landowners in surveys and statistics released by the NWOS.

Recommendations presented for improving the methodology and representation of family forest landowners at various acreage levels was well received and is under consideration by the USFS. FLA will continue to work with the USFS at all levels to ensure that fair representations of core family forest ownerships is presented in data and reports.

**Why the National Woodland Owners Survey (NWOS) is important to core forest landowners**

The objectives of the NWOS are to address questions related to:
Who owns America’s forests and woodlands?
Why do they own these lands?
What have they done with these lands in the past?
What do they plan to do with these lands in the future?
How have characteristics, attitudes, and behaviors changed over time?

The goal is to obtain statistically reliable estimates of population parameters that answer these questions for the nation and all U.S. states, territories, and protectorates.

**Highlights of the assessment on the NWOS survey, methodology and report.**

**THE TERM FOREST WAS INTENTIONALLY NOT USED IN THE NWOS SURVEY**
While the NWOS bills itself as the “official family forests census,” the survey questionnaire intentionally chose to use the term “wooded land” instead of “forest” to describe the land owned and managed by the survey respondents.

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**General Questions about Your Wooded Land**

3. Wooded land covers 70% of Alabama.
   Wooded land includes:
   ✓ Woods, woodlots, timberland, and forests
   ✓ Land at least 1 acre in size, 120 feet wide, and has at least 10 trees per acre
   ✓ Land at least 1 acre in size, where trees were removed and trees will grow again
   Wooded land does not include:
   ✓ Christmas tree farms, orchards, or nurseries
   ✓ Land that is mowed for lawn

   a. How many total acres of land do you currently own in Alabama?
   [ ] [ ] [ ] Acres of land in Alabama

   b. How many acres of wooded land do you currently own in Alabama?
   [ ] [ ] [ ] Acres of wooded land in Alabama

*Excerpt from the USDA Forest Service National Woodland Owner Survey, 2011-2013: Design, Implementation, and Estimation Methods*

“Pretesting via focus groups was used to develop questions that elicited accurate information. In writing the questions, the goal was to use language that someone with the equivalent of an eighth-grade education could easily understand. In addition, **efforts were made to use words common to private forest owners** rather than technical, forestry terms. For example, the term forest was not used in the survey instrument because it has a different connotation to owners and forestry professionals. Instead the phrase “wooded land” was used throughout the survey.”
This is puzzling as the term “forest” is easily understood at the eighth-grade level and is not “technical jargon.” Moreover, according to Google Labs Ngram viewer, a data analysis center that evaluates the prevalence of various terms, “forest” is 1,915 times more common than “wooded land” in the corpus of the English language.

![Graph showing prevalence of “forest” and “wooded land” across time](image)

While the NWOS authors choose not to use the word “forest” due to connotation of meaning, the survey included terms “green certification” and “timber harvesting.” Terms much less common and having various connotations of meaning to the average person at the eighth-grade level.

Perhaps it is likely the average individual would not consider an acre of land with 10 trees a forest, as is defined by the NWOS. Therefore “wooded land” might have been used to increase response rates for people who would normally return the survey marked “Not Applicable” to them. Regardless of the reason, consciously choosing to use the term “wooded land” instead of forest warrants reexamination as does the definition used to define “forests” in the context of the NWOS.

**FOCUS GROUPS IN HAWAI**I AND NEW MEXICO INFLUENCED WORD CHOICE, QUESTIONS AND SURVEY DESIGN.

As is common with surveys, focus groups were conducted to determine word choice, questions, and design of the survey. Of the 6 states NWOS conducted focus groups 4 of them fall into the bottom half of states in terms of family forest acres and ownerships. Yet these focus groups dictated the terms and questions used in the survey. Two of the states, Hawaii and New Mexico had such a low response rate to the NWOS survey (42 and 33 responses respectively) that the data was not statistically reliable to produce state level summaries. Why would the NWOS choose such states to conduct focus groups to influence the terminology and design of the survey at the expense of the taxpayer?
**THE NWOS FOCUSES ON THE WRONG OWNERS. WE KNOW THE LEAST ABOUT THOSE WHO ARE STEWARDS OF THE MOST FOREST ACREAGE.**

NWOS lumps all owners in the overall results, treating those “who have a bit of ‘woods behind your house where the kids play and you cut firewood’ the same as those who own a ‘forest’ that earns your family income.” By including owners of one acre of land with 10 trees, or 10 percent tree cover, the estimate of 10.6 million forest landowners is an exaggeration and misrepresentation of family forest landowners in America.

NWOS reports an inaccurate assessment of *REAL* forest landowners in America

<table>
<thead>
<tr>
<th>State</th>
<th>Acres of Forestland*</th>
<th>Est. # of forest owners 10 acres +</th>
<th>NWOS Survey Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawaii</td>
<td>566,000</td>
<td>6,000</td>
<td>42</td>
</tr>
<tr>
<td>New Mexico</td>
<td>6.3 million</td>
<td>46,000</td>
<td>33</td>
</tr>
</tbody>
</table>

*Acre count only includes acres of ownership 10 acres and above.

Of the 10.6 million “forest” owners estimated by the USFS

- 62% (6.6 million) only own 1-9 acres, with a qualification of 10 trees per acre.
  - This largest segment of “forest” owners only represents only 7% of family forest land, which is most likely “wooded lots.”
- 89% (9.4 million) own less than 50 acres and account for only 28% of family forest land.
- 11% (1.2 million) own more than 50 acres and account for 72% of family forest land
- 0.5% (53,500) own more than 500 acres and account for 26% of family forest land

This creates a scenario wherein the least amount of information is known about the largest acreage of private forest (and presumably the greatest conservation and wood supply impact).
When these 6.6 million under 10 acre “forest landowners” are included in queries from the NWOS data it produces misleading facts and statements that are in reality false and harmful to the real forest landowners that are contributing the lion’s share to the wood markets and ecological benefits to society.

This is especially important when forest organizations advocating certification programs often will note that “nationally, fewer than 10 percent of family lands in the U.S. are certified, and only approximately 1 percent of the family landowners.”

### NWOS Survey Responses Driving the Narrative

<table>
<thead>
<tr>
<th>Acreage Range</th>
<th>Percentage</th>
<th>Total Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;99 acres</td>
<td>48%</td>
<td></td>
</tr>
<tr>
<td>100-499 acres</td>
<td>34%</td>
<td></td>
</tr>
<tr>
<td>500-4,999</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>5,000 +</td>
<td>2%</td>
<td></td>
</tr>
</tbody>
</table>

The survey responses and thus the overall data is far outweighed by representation of landowners owning less than 100 acres (48 percent of respondents) than those owning 500 to 4,999 acres (15 percent of respondents), while families owning 10,000 acres or more only had a 1 percent representation. The scenario this creates is that overall responses are lumped together and then considered in driving policy related to the sustainability and management of forest and wood supply. Landowners, owning less than 500 are only able to contribute to the wood supply in a meaningful way every 20 to 30 years at best.

Future NWOS studies should strongly consider oversampling owners of larger acreages so that estimates reflecting the largest acreage of private forest are more precise. The purpose of this oversampling is not to discount the conservation contribution of smaller acreages, but to acknowledge that the attitudes and behaviors of large acreage owners impact wood supply, markets and conservation at a larger scale.
Further misrepresentation of the core forest landowner is added by the inclusion of rangeland and their owners’ responses being treated the same as a forestland owner. The inclusion of rangeland is particularly influential in the 10,000 acres or more category of ownership.

In the 2013 NWOS, there were only 88 responses of 10,000+ acre ownerships. Thirty-three of them were from West Texas (compared to 9, 6, 5 and 1 owners in Alabama, Oregon, California, and Georgia respectively). This places 38% of the responses for 10,000+ acreages in a geographic location that USFS maps indicate there are no forests.

Therefore, the attitudes, concerns, and management practices of these landowners likely represent rangeland stewardship practices rather than forestry stewardship practices, and thus skew the results of owners of 10,000 acres or more. Similarly, for the category of 5,000 – 9,999 acres, West Texas has a disproportionately high response rate of 20 landowners compared to other major forestry states with large forest landowners.

Coupled with West Oklahoma’s responses of 4 landowners, where again USFS maps indicate there are no forests, for this size category (5,000 – 9,999 acres) of “forest land” owners, 20% of the results are dictated by landowners who do not own forestland. Overall, 15% of the data available on family forest landowners of 1,000+ acre parcels is derived from West Oklahoma and West Texas.
West Texas had the ninth most survey responses (259) among all states. Meaning these landowners, where rangeland dominates, had more influence in the survey results than the majority of the states with the most family owned forest acres.

Responses from West Texas, even outnumbered responses from East Texas (189) where forests actually exist, and timber is an economy driver. Other top forest states that had equal or fewer survey responses than West Texas were Oregon (115), California (117), Florida (147), and Louisiana (149).

Again, the NWOS results are skewed by allowing rangeland owners where no meaningful forestland or timber exist to have more influence in the data and results than forest landowners of top-ranking forest and timber states. Resources could be better applied in garnering responses from true forest land states and owners.

The inclusion of rangeland in the 2013 NWOS should be better justified, particularly when the NWOS is billed to be “the official census of forest owners” and the stated aim of the NWOS is to increase “understanding of woodland owners who are the critical link between forests and society.”

The survey seems to have an identity problem in that it is actually a survey of wood lot owners, but includes the characteristics, concerns and management of rangeland owners and then bills itself as the official census of forest owners.

STATES FOREST ACREAGE AMOUNT DOES NOT CORRESPOND TO STATE SAMPLE SIZE. HIGHEST SAMPLE SIZES COME FROM MAINE AND VERMONT

In addition to the problems of high survey responses included from West Texas, the NWOS allowed state intensification of less populated states with fewer forest acres to have more
influence in the survey results. The result is an inflated sample size of smaller landowners. States with the highest forest acreage should have highest sample sizes, yet highest sample sizes come from Vermont, Maryland, and Connecticut – outside the “wood basket” states of the Southeast.

<table>
<thead>
<tr>
<th>States with highest # of respondents</th>
<th>Wood basket states # of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vermont</td>
<td>Alabama</td>
</tr>
<tr>
<td>Maryland</td>
<td>Arkansas</td>
</tr>
<tr>
<td>Connecticut</td>
<td>Florida</td>
</tr>
<tr>
<td>Delaware</td>
<td>Georgia</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>Louisiana</td>
</tr>
<tr>
<td>New Jersey</td>
<td>Mississippi</td>
</tr>
<tr>
<td>Texas (West)</td>
<td>North Carolina</td>
</tr>
<tr>
<td>Texas (East)</td>
<td>South Carolina</td>
</tr>
</tbody>
</table>

Hence, of the little data that exists on core forest owners, most of it comes from outside the area of the country where most privately owned, timber-producing forests exist – further skewing the data on this crucial group of landowners. Oversampling of states outside the wood basket must be corrected in the next administration of the NWOS.

It is unclear if and how the NWOS adjusted the weightings in the states with intensified sampling, as it is not documented in technical documents or the statistical syntax (the written log of all data manipulation and statistical analysis).

**THE NWOS FINDINGS AT THE STATE LEVEL PROVIDE AN INCOMPLETE AND INACCURATE ASSESSMENT**

Numerous states have insufficient data to analyze the prominent trends and characteristics of larger landowners.

Often during surveys and polling of presidential races or ballot measures it is acceptable to have a 3% margin of error, which allows a researcher to survey just 1,068 people, so long as those people are representative. If a statistical report on a ballot initiative indicates it will pass at 64% (±3%), there is a great likelihood the initiative will pass with between 61% and 67% approval.

However, there is so much uncertainty in the NWOS responses that in most states meaningful estimates for reporting statistical findings do not exist, and in no state can you meaningfully discuss large acreage owners (500 or more acres) with any reasonable level of precision. Except for Texas, all states have a margin of error of 10% or higher for data on ownerships of 500 acres or more. In more than half the states the margin of error for ownerships of 500 or more acres is well above 20% with many states margin of error in the 30% range.
Yet, NWOS produces state fact sheets used by state forestry departments to tell the narrative of forest landowners in these states. **FLA is strongly advocating that the next iteration of the NWOS data and summary reports segment results based on acre ownership categories and report the number of response and margin of error.**

<table>
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<tr>
<th>State</th>
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<th>50-199 ac</th>
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<td>15</td>
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<td>0</td>
<td>2</td>
<td>263</td>
<td>6.04%</td>
<td>18.52%</td>
</tr>
</tbody>
</table>

This table shows the survey responses per state/acre ownership and the margin of error (MOE) at the state level for all ownership categories (MOE State) as well as for ownership categories above 500 acres where the MOE is so high the results are unreliable.

**FAMILY FOREST LANDOWNERS OF SIGNIFICANCE FALL BETWEEN THE GAPS**

Based on FLA research and findings, the NWOS is overlooking core forest landowners, resulting in misguided results, conclusions, and policies. Considering the growing reliance on core forests to solve landscape level environmental issues and fuel the rural economy of many of these states, accurate data is needed on this constituency.

The largest family forests are among the most important economically and environmentally. These ownerships are large, uninterrupted tracts of contiguous forests – quite apart from the fragmented wooded lots on the fringe of urban and suburban areas.

This matters because a 10-acre plot cannot sustain the recovery of an endangered red-cockaded woodpecker, nor meaningfully contribute to the restoration of longleaf pine across...
the Southeast, nor have the capacity of trees to contribute to the forest economy, the same way that a single owner of 500, 1,000, 5,000 and 10,000 acres can. To solve landscape-level problems, policy, federal funding, NGO, and corporate initiatives would be better focused on forests that have the scale to meaningfully contribute to America’s economic and environmental well-being.

Policymakers, NGOs and corporations are using NWOS data to draw conclusions about large landowners, management of family forests and the sustainability of the resource, but because the NWOS focuses on the small landowners, it cannot serve as an accurate guide for shaping policies that affect core forest owners.

While the NWOS research focuses on family forest owners, whose average landholdings are approximately 67 acres, new research is needed with a focus on forest owners at the 500 acre and above ownership category.

Lack of resources is often cited as the reason for the USFS NWOS not being able to collect more data on core family forest owners. This is unacceptable, especially given that the NWOS has recently undertaken two new survey programs: NWOS Urban and NWOS Corporate. Neither of which captures collection data of this key constituency.

Urban NWOS is a national effort to examine the social dimensions of the urban forest, i.e. the private landowners who manage the urban forest (i.e. between 1 and 10 trees in their yard) and other urban green space. Urban NWOS was pilot tested in Austin, Texas and across multiple cities in Wisconsin. It is currently being implemented in Baltimore, Maryland. Target cities for 2019 are New York City, Houston, Denver, Portland, Illinois, St. Louis and for 2020 target cities are Washington DC, Philadelphia, and San Juan. It is very likely that soon the USFS will know more about urban tree owners than family landowners whose forests have the highest economical and environmental impact on America’s natural resources.

Corporate NWOS was first implemented in 2018 with a target audience of large corporate forest landowners. According the NWOS website, “The large (defined as owning 45,000 acres of more forestland) corporate owners are different in terms of behaviors, attitudes, and structures than the owners contacted in the Rural and Urban NWOS and are therefore the focus of a separate NWOS module.”

However, the NWOS Rural does not include responses of family forest owners who incorporate their holdings into an LLC or other corporate tax status favorable to generational transfer. For FLA this is a large portion of our membership who are 3rd, 4th and even 5th generation family forest landowners who have been able to pass their forest legacy to the next generation because of being tax savvy. This exclusion of a family forest owners because of a tax status is at odds with the number one and three top concerns of the NWOS findings of taxes and legacy respectively.
MOVING FORWARD
FLA is encouraged by recent meetings with the USFS to discuss how to improve the methodology of the NWOS and need for segmentation and more reliable data on larger forest landowners. The following represents initial recommendations based on the Technical Review of the USFS National Woodland Owners Survey commissioned by the Forest Landowner Foundation and conducted by Responsive Management and Chase and Chase Consulting.

Fair and Accurate Representation in Future NWOS Reports and Data
- Do not portray findings based on 10+ acres plus as a fair representation of forest
- Fair representation of forest landowners based on ownership acre segments in future NWOS data collection and survey summaries
- Produce a report specifically on large acreages [500+] with a sufficient sample size
- Include tables depicting number of responses for all acreage categories and margin of error in all related reports
- Disallow for rangeland to be counted as wooded or forest land and responses to be included in NWOS results
- Clearly state the definition of forest used to categorize the ownership of land in all electronic and printed material.
- Clearly state the survey is based on wooded land owners as well as forestland owners

<table>
<thead>
<tr>
<th>Future NWOS survey efforts of family forest landowners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct the over-sampling of smaller forest landowners so that a more accurate assessment of America’s forest landowners can be achieved, especially when solving for sustainability of forests related to markets, and landscape level issues</td>
</tr>
<tr>
<td>Correct the under-sampling of larger, core forest owners so that a better understanding can be achieved of these high value, high impact forestlands</td>
</tr>
<tr>
<td>Revise the definitions of forest landowners to reach a more accurate understanding of private forestland in America</td>
</tr>
<tr>
<td>Disallow for rangeland to be counted as wooded land and included in NWOS results</td>
</tr>
<tr>
<td>Include all family forests owners’ responses regardless of tax status</td>
</tr>
<tr>
<td>State sample size of responses should correspond with state’s private forest acres</td>
</tr>
<tr>
<td>Invest the resources to receive sample size of larger acre family forest landowners that result in acceptable margin of error</td>
</tr>
<tr>
<td>Produce findings and reports in categories of wood landowners (smaller acreage size) and forest landowners (larger acreage size)</td>
</tr>
<tr>
<td>Conduct a more robust nonresponse bias check</td>
</tr>
<tr>
<td>Further minimize the coverage error by conducting more quality assurance of the remote sensing</td>
</tr>
<tr>
<td>Conduct analyses on continuous data where possible to maintain explanatory power rather than artificially categorizing the concepts</td>
</tr>
<tr>
<td>Because state information is of interest, a sufficient sample should be obtained to provide state-level estimates with acceptable levels of uncertainty</td>
</tr>
</tbody>
</table>
Administration of the NWOS Recommendations

✓ Develop an advisory committee with representatives of core forest landowners, academia and stakeholders to provide input and engagement in future iterations of NWOS.

✓ Address needed changes to the methodology to improve accuracy based on American Association for Public Opinion Research guidelines, and recommendations contained in the technical review of the NWOS by Responsive Management and Chase and Chase Consulting.

✓ Seek USFS internal assessment of NRS conducting NWOS; advocate for revaluation of NWOS being conducted by NRS and the Family Forest Research Center.