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Forest Inventory and Analysis

Fiscal Year 2010 Business Report





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Cover photo: *A foggy morning in the pines on the Ouachita National Forest by Bill Lea, Southern Research Station.*

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Executive Summary

For more than 75 years, the Forest Inventory and Analysis (FIA) program has played an integral role in managing the Nation's forest resources and conducting the orderly inventory of these resources, which is required to develop effective management scenarios. In recent years, an increased number of major decisions affecting the Nation's forests have been made with reference to and reliance on FIA findings and forest resource evaluations. Contemporary topics include carbon sequestration, climate change, land-cover and land-use change, pollutant effects, and fire risk.

In 1999, Congress directed the U.S. Department of Agriculture (USDA), Forest Service to reevaluate its statewide inventory mission and to make the transition from an approach in which each State is surveyed periodically to one in which each State is inventoried annually. FIA developed, in concert with its partners, a strategic plan to carry out the new congressional mandate. Approved by Congress, the "Strategic Plan for Forest Inventory and Monitoring" included a requirement for an annual business report, which would outline the status and progress of the annualized inventory program.

This business report, our 13th, tells the taxpayers, partners, and clients what the program has accomplished with the financial resources that they provided and what the program will accomplish in the coming year with budgeted financial resources. This relationship with taxpayers, partners, and clients is integral to FIA's continued success, because accountability is our first priority. Some of the key findings of this report are—

Annualized progress—In fiscal year (FY) 2010, three new States (Hawaii, Nevada, and Wyoming) were added, bringing activity to 49 States, or 98 percent of all States, plus coastal Alaska. We measured a total of 44,510 plots on the base grid, which represents 14 percent of the U.S. land total, excluding interior Alaska. The interior Alaska inventory continues to await sufficient appropriated funding to enter the program. Moreover, in compliance with congressional guidance, periodic inventories have been completed in the Commonwealth of Puerto Rico, U.S. Virgin Islands, Federated States of Micronesia, American Samoa, Guam, the Republic of Palau, Republic of the Marshall Islands, and the Commonwealth of the Northern Mariana Islands, which are all exempt from implementation of the annualized system.

Funding—In FY 2010, total funding available for the FIA program was \$80.3 million from all sources, a net increase of

\$4.9 million from FY 2009. This funding consisted of \$71.8 million appropriated by Congress, plus \$0.9 million in net adjustments from the previous fiscal year and \$7.5 million in partner funds to accommodate shorter cycles and program enhancements. In FY 2010, the appropriated funding level was \$6.3 million above FY 2009, allowing the addition of Hawaii, Nevada, and Wyoming, but it remains \$7 million short of the target levels required to complete the transition to a fully annualized inventory program and add interior Alaska.

Fire transfer impact—There were no fire transfers in FY 2010.

Partner support—Partners contributed \$7.5 million to the program in FY 2010. Through cost-share, 47 States contributed \$3.3 million toward buying down their cycles to 5 years, and States and other partners added \$4.2 million for plot intensification and other program enhancements. Overall, State contributions increased by \$1 million from FY 2009.

Grants and agreements—When external cooperators can complete critical FIA work with equal quality for less cost, FIA contracts for these services—a total of \$13.9 million was spent in this way in FY 2010. Of this total, FIA provided \$7.9 million to State forestry organizations, universities and research cooperators received \$3.1 million to improve program efficiency and provide critical research and analysis, and the remaining \$2.0 million provided information management support. These business arrangements are detailed in appendix table C-5.

Data availability—Forty-two States and coastal Alaska now have access to online data that are less than 2 years old. The availability of this data improves partner access to current information on the Nation's forests and allows analysts to clear up the backlog of analytical reports. With this online data, FIA supplied information for 423 spatial data requests and more than 104,000 online data requests.

Five-year reports—By FY 2010, 41 States have completed a 5-year report or periodic closeout report since annualized inventory began in 1999. The goal is to reach 100 percent completion by the end of FY 2011. This will bring FIA into full compliance with its legislative mandate, and it will establish a permanent cycle of State analytical reports beginning in FY 2012. In addition to publishing five 5-year reports, FIA had 198 additional publications, of which 74 were published in peer-reviewed journals.

Quality assurance—In FY 2010, FIA quality-checked 9 percent of all field plots to ensure that the highest quality data are loaded into FIA databases. The Quality Assurance staff continues to actively improve documentation, training, and standards.

User groups—FIA relies heavily on periodic meetings with users and clients to ensure that we are providing the highest quality service and meeting program objectives. In 2010, FIA held one national and four regional user group meetings to gauge how well we are meeting the goals stated in the strategic plan and to seek input for future program enhancements. FIA also held three regional or national management meetings.

Personnel—Quality staffing is critical to the success of the FIA program. FIA, directly and through cooperators, employs 596 people. Contractors are integral to the efficient delivery of the FIA program, and they provided 205 of the 596 employees, or 34 percent of the total workforce. Of the total workforce, 132 were employed in information management, techniques research, and resource analysis, and they provided 991 consultations (10,381 hours) to help users and clients effectively use FIA data.

Performance history—Appendix table C-12 of this report summarizes dozens of key program performance measures for FY 2003 through 2010 to allow clients to quickly review program progress without gathering up our annual reports.

Other program features—FIA is charged with monitoring and reporting on the status, condition, and trends of all the Nation's forests. Although plot-based field surveys provide most of this information, additional questionnaires and field-based surveys are conducted to report on timber products output (TPO), logging utilization, fuelwood production, the

characteristics and management objectives of the Nation's private woodland owners, and several indicators of forest health. During the past 11 years, FIA has collected such data from more than 89,000 surveys, samples, and logging sites. This information, in conjunction with FIA plot data, is critical to monitoring the sustainability of the Nation's forest resources.

FIA had a productive year in FY 2010, and we look forward to further progress in FY 2011. Important goals for FY 2011 include—

- Continue annualized inventory of 49 States and coastal Alaska, which are currently in the program.
- Complete migration of major FIA data operations to the National Information Technology Center.
- Prepare final version of Field Guide 6.0 for implementation in FY 2012.
- Develop a draft of the program's 2013–2017 strategic plan.
- Begin a new cycle of data collection for the National Woodland Owner Survey.
- Nationalize and modernize the program's TPO operations.
- Work with partners to improve land-cover and land-use classifications.
- Further improvements to the Forest Inventory Data Online system.
- Complete layout production of the FIAtlas book.
- Continue piloting urban forest inventory.
- Continue piloting a national rangeland inventory.

Introduction

The Forest Inventory and Analysis (FIA) program of the U.S. Department of Agriculture (USDA), Forest Service provides the information needed to assess the status, trends, and sustainability of America's forests. This business report, which summarizes program activities in fiscal year (FY) 2010 (October 1, 2009, through September 30, 2010), gives our customers and partners a snapshot of past activities, current business practices, and future program directions. It is designed to increase our accountability and foster performance-based management of the FIA program. (Note: This business report does not include statistical information about the forests of the United States. Those who wish to obtain such information should contact the appropriate regional or national FIA office listed on the inside back cover of this report or go to <http://www.fia.fs.fed.us>.)

The FIA program has been the Nation's continuous forest census since 1930. We collect, analyze, and report information on the status and trends of America's forests: how much forest

exists, where it exists, who owns it, and how it is changing, as well as how the trees and other forest vegetation are growing, how much has died or been removed, and how the harvested trees are used in recent years. This information can be used in many ways, such as in evaluating wildlife habitat conditions, assessing sustainability of current ecosystem management practices, monitoring forest health, supporting planning and decisionmaking activities undertaken by public and private enterprises, and predicting the effects of global change. The FIA program combines this information with related data on insects, diseases, and other types of forest damage to assess the current health and potential risks to forests. These data are also used to project how forests are likely to appear in 10 to 50 years under various scenarios in order to evaluate whether current forest management practices are sustainable in the long run and to assess whether current policies will allow our grandchildren and their grandchildren to enjoy America's forests as we do today.



Changes From Previous Year's Business Reports

The FIA program continues to seek performance measures that accurately reflect the program's progress toward meeting the goal of annualized inventory in all 50 States.

The summary section on program plans for 2010, accomplishments for 2010, and plans for 2011 have been divided into thematic sections for improved readability.

In FY 2010, Congress appropriated \$2 million to fund work related to FIA in the Experimental Forests and Ranges. A section summarizing this effort has been added to the report.

President Obama's American Recovery and Reinvestment Act (ARRA) passed by Congress provided supplemental

appropriations to create jobs and promote economic stability; two of these projects had a direct effect on FIA. One is related to base forest inventory in New Mexico and the other is related to urban forest inventory in the West Coast States. A brief summary of these projects is provided in this report.

Appendixes have been modified to include summaries of historic data access statistics (appendix table C-7), timber product and ownership surveys (appendix table C-8), and forest health indicator samples (appendix table C-9). Previous appendix tables C-7, C-8, and C-9 have been renumbered as C-10, C-11, and C-12 for comparison with earlier annual reports.



Fiscal Year 2010 Program Overview

In FY 2010, the FIA program completed the 12th year of program transition to an annual inventory system as outlined in the *Strategic Plan for Forest Monitoring* written in response to the Agricultural Research, Extension, and Education Reform Act of 1998 (Public Law 105-185). The FIA program includes three sample levels, or “phases”: Phase 1 (P1), which consists of remotely sensing for stratification to enhance precision; Phase 2 (P2), which is based on the original set of FIA forest measurement plots (approximately one plot per 6,000 acres); and Phase 3 (P3), which consists of a subsample of P2 plots measured for a broader set of forest ecosystem indicators (approximately one sample location per 96,000 acres). By the end of FY 2003, our goal was to implement an annual FIA program that measures at least 10 percent of all P2 sample locations per year in the Western United States, 15 percent of P2 sample locations per year in the Eastern United States, and P3 sample locations at 1 of every 16th P2 location each year in all States. Table 1 shows the overall distribution of P1, P2, and P3 elements of the FIA sample for the United States. The numbers in this table are for illustrative purposes only and do not include possible additional plots that may be required as a result of partially forested sample locations. This can add 15 to 20 percent more actual plots that have to be visited to collect data.

Owing to lack of full appropriated funding, we are now several years behind the original plan. The base program includes annual compilations of the most recent year’s information, with full reporting at 5-year intervals. All States have the option to contribute the resources necessary to bring the program up to the full sample intensity of 20 percent per year, or to make other value-added contributions such as funding new measurements or additional sample locations. In FY 2010, the total appropri-

ated funding level remains \$7 million short of the target level required to complete the transition of the base program to full implementation. The following sections highlight current outputs and products, program resources, and partner contributions.

Outputs and Products

Appendix table C-1 shows some comparisons across FIA regional units in the rates, costs, and performance of implementing the FIA program. In FY 2010, we were active in 49 States plus coastal Alaska (fig. 1), measuring 42,510 P2 and P3 sample locations from the base grid, or 14 percent of the total. At the end of FY 2010, all States were covered by some level of annual FIA program activity, but only 49 States (98 percent) were fully implemented, with interior Alaska awaiting funding. A funding increase of \$6.3 million in FY 2010 allowed us to add Nevada, Wyoming, and Hawaii to the annualized inventory. FIA’s congressional mandate, under the Renewable Resources Research Act of 1978 (PL 95-307), stated that the Nation’s Trust Territories and Freely Associated States were to be treated as States for research purposes. Since 2001, in compliance with this mandate, periodic inventories have been completed in the Commonwealth of Puerto Rico, U.S. Virgin Islands, Federated States of Micronesia, American Samoa, Guam, the Republic of Palau, the Republic of the Marshall Islands, and the Commonwealth of the Northern Mariana Islands, all of which are exempt from the annualized system and have periodic inventories.

The FIA program produced 203 reports and publications in FY 2010, 3 fewer than in FY 2009. Of these publications, 47 were core publications consisting of reports specific to

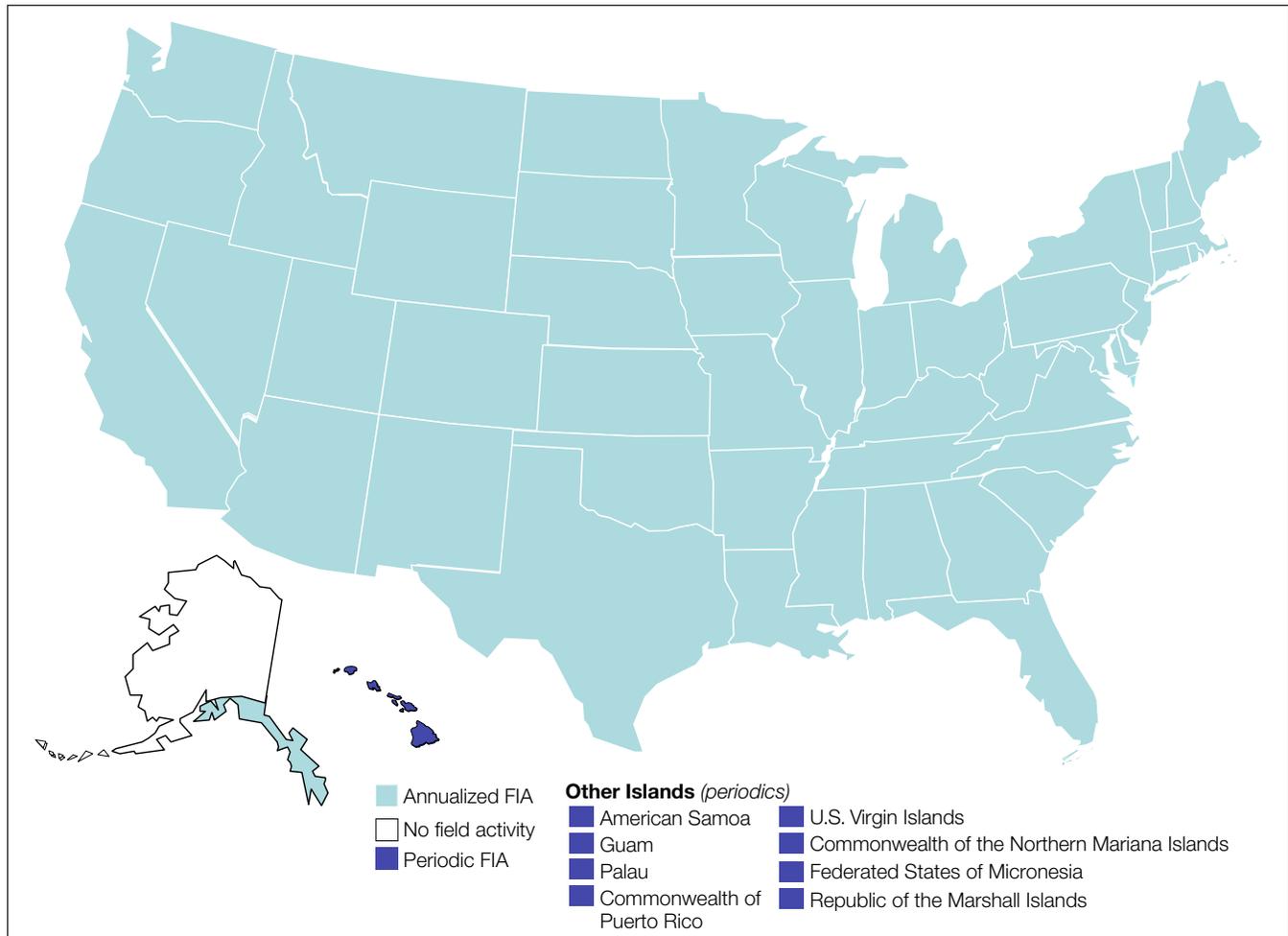
Table 1.—Overview of land area; forest area; and estimated P1 pixels, P2 plots, and P3 plots by region, FY 2010.

Region	Land area	Forest area	Forest	All P1*	All P2	All P3	Total P2, P3
	mil. acres	mil. acres	percent	mil. pixels	plots	plots	plots
North	608	178	29	39.5	94,928	6,414	101,342
South	535	215	40	34.8	83,559	5,646	89,205
Interior West	548	145	26	35.6	85,560	5,781	91,341
Pacific Coast (California, Oregon, Washington)	203	85	42	13.2	31,753	2,145	33,898
Coastal Alaska	41	15	36	2.7	6,444	435	6,880
Interior Alaska	324	112	35	21.0	not set	3,415	3,415
Islands (including Hawaii)	7	4	53	0.5	1,083	73	1,156
Total	2,267	753	33	147	303,327	23,910	327,237

FY = fiscal year. P1 = Phase 1. P2 = Phase 2. P3 = Phase 3.

* MODIS 250m pixels at 15.4 acres each.

Figure 1.—FIA implementation status, 2010.



FIA = Forest Inventory and Analysis.

a complete survey unit, or a complete State, national forest, or national report. Core reports include 5-year State reports required by legislation. We also published 74 articles in peer-reviewed journals (36 more than in FY 2009) and 30 articles in proceedings from scientific meetings and conferences (compared with 87 in FY 2009). Although the combined number of peer-reviewed and proceedings articles has remained constant, program emphasis has shifted toward more peer-reviewed outputs. FIA staff participated in 991 significant consultations with FIA customers, requiring 10,381 hours of staff time—equivalent to more than 5 full-time staff positions. The FIA technical staff met on several occasions to further refine the national core FIA program, resulting in continued improvement of the national core field guide and enhancement of Internet tools for accessing and analyzing FIA data, including the National Information Management System (NIMS), which provides a single national platform for processing FIA data and

posting it on the Web. Our Internet resources processed more than 100,000 data retrievals in which FIA customers obtained user-defined tables, data downloads, and maps of interest.

Program Resources

Congress currently appropriates funds annually for the FIA program in two different Forest Service deputy areas: (1) Research and Development (R&D), which had \$66,939,000 in appropriated funds, and (2) State and Private Forestry (S&PF), which had \$4,878,000 in appropriated funds. Most Federal FIA funding, or 93 percent, is contained within the research budget of the Forest Service. In FY 2010, the amount of total funding appropriated by Congress for the FIA program was \$71,817,000, an increase of \$6,251,000 from the FY 2009 level of \$65,536,000 (appendix table C-12). In FY 2010 the S&PF Forest Resource Inventory and Analysis budget line of

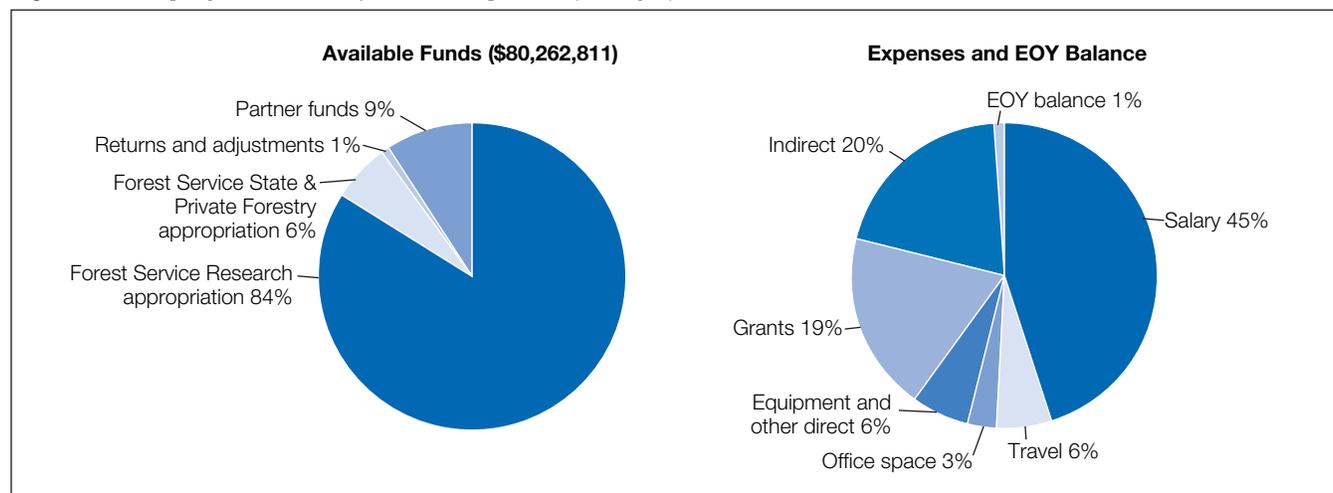
\$4,878,000 was provided to support the FIA program in States that provide cost-share contributions. States providing inventory cost-share funds contributed an additional \$3,274,048 toward buying down to 5-year cycles. The FIA program and States and other partners also added \$4,320,427 for plot intensification and other program enhancements. Total available program funding, including \$929,576 in pre-year adjustments, was \$80,262,811 in FY 2010 (fig. 2). Appropriated funding was 90 percent of the target funding needed for full program implementation.

In its annual appropriation, Congress intended for an amount equal to the S&PF Resource Inventory and Assessment appropriation to be provided to States each year to assist in implementing the FIA program. During budget allocation, FIA treats funds from all sources as a single pool and then allocates funds from the various inflow accounts to maximize efficiency. Each year, however, FIA ensures that congressional intent is met

for the S&PF appropriation. Table 2 summarizes FIA funding activity to States from FY 2004 through 2010 and demonstrates the program's full compliance with congressional intent.

Across FIA regions, cost and productivity figures differ because of the cyclical nature of the current inventory system and because of differences among field units in operational methods and ease of access to property. Rates of effective indirect expenses in FIA field units in 2010 ranged from 7 to 13 percent across the country (appendix table C-2), reflecting differences in both sources of funding as well as research station indirect expense assessment practices. The National Office has an 81-percent rate of indirect cost because of its budget, including the USDA overhead and program-wide charges to the Albuquerque Service Center, which increased by \$845,000 to \$6,400,000 in FY 2010. Figure 3 shows the total appropriated funding available for FIA from FY 2000 to FY 2010 from all sources, as well as

Figure 2.—FIA program available funds and expenses by category, 2010.



EOY = end-of-year. FIA = Forest Inventory and Analysis.

Table 2.—Annual FIA appropriations and allocation of State and private funds to meet congressional intent.

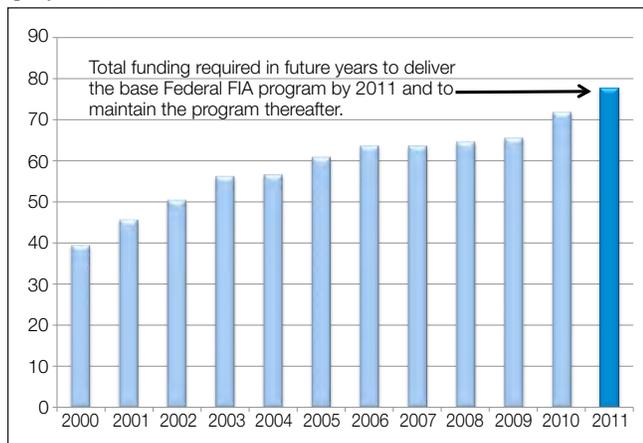
Category	Fiscal year						
	2004	2005	2006	2007	2008	2009	2010
	<i>Thousand dollars</i>						
R&D appropriation	51,714	55,923	59,329	59,380	60,372	60,770	66,939
S&PF appropriation	4,939	4,958	4,312	4,225	4,269	4,766	4,878
Total appropriated	56,653	60,881	63,641	63,605	64,641	65,536	71,817
FIA data collection grants to States	6,318	5,954	7,364	7,209	6,924	7,907	8,289
Number of States	28	22	24	26	24	28	26
Additional FIA allocation above congressional intent for the S&PF appropriation	1,379	996	3,052	2,984	2,655	3,141	3,411

FIA = Forest Inventory and Analysis. R&D = Research and Development. S&PF = State and Private Forestry.

the projected future total funding needed to deliver the base Federal program beyond FY 2010. Refer to appendix table C-12 to view the trend data in FIA performance measures for 2003 through 2010.

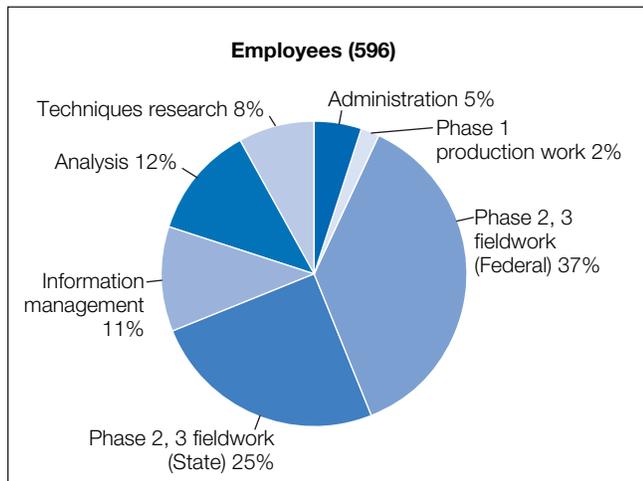
In FY 2010, FIA Federal program staffing consisted of 392 Federal person-years of effort (appendix table C-3), up from 381 Federal person-years in FY 2009. Cooperators, especially State forestry organizations, through grants and agreements, accomplish much of the work done by FIA, and they added 205 employees for a total work force of 596. The additional cooperator employees included 149 State field employees, 14 information management specialists, 20 analysts, 17 researchers, and 5 administrative specialists. Cooperator employees constitute 34 percent of the total FIA workforce.

Figure 3.—FIA appropriated funding level, 2000–2011 (projected).



FIA = Forest Inventory and Analysis.

Figure 4.—FIA program employees by job group, 2010.



FIA = Forest Inventory and Analysis.

Of all the FIA employees, both Federal and cooperator, approximately 62 percent were involved in data collection and field support, 23 percent in analysis and information management, 5 percent in program management and administration, 8 percent in techniques research, and 2 percent in P1 production work (fig. 4).

Partners' Contributions

The complete FIA program envisioned by Congress was to be a Federal-State partnership, with both Federal and State partners contributing resources to accomplish the work. Congressional guidance indicated that the base Federal commitment is an inventory program that collects data from 10 percent of the sample locations in the Western United States (10-year cycle) and 15 percent of the sample locations in the Eastern United States (7-year cycle) on an annual basis, with comprehensive, analytical reports for all States produced at 5-year intervals.

At their discretion, partners may choose to contribute the resources needed to bring the FIA program up to the full 20-percent measurements per year described in the law. In addition, or alternately, partners may choose to contribute resources for other purposes that add value to the FIA program from their perspective, such as intensifying the base FIA sample location grid to support analysis at finer spatial resolution, funding additional types of measurements on FIA sample locations, or providing analyses or reporting beyond that provided by FIA. The willingness of partners to contribute resources demonstrates the inherent value of the FIA program as a flexible framework upon which to address other issues of interest.

Appendix table C-4 lists those partners that have contributed resources to the FIA program in FY 2010, either to achieve the 20-percent cost-share program envisioned by Congress or to add value to FIA in other ways. These resources include staff time, vehicle use, office space, equipment, travel costs, and other noncash items that support or add value to the FIA program. Contributions are valued for reporting purposes in terms of what it would have cost the Federal FIA staff to provide the same service, which may not necessarily be the same as the actual cost to the partner making the contribution. Overall, partners contributed \$3.3 million toward the full 20-percent FIA program envisioned by Congress, and another \$4.2 million in contributions that add value to the FIA program, for a total of \$7.5 million in partners' contributions. This amounts to \$1.0 million more than was contributed by partners in FY 2009. The source of the partner contributions depends on the region of the country and the ability of States and partners to contribute. In the West, where forest land ownership is primarily Federal, the

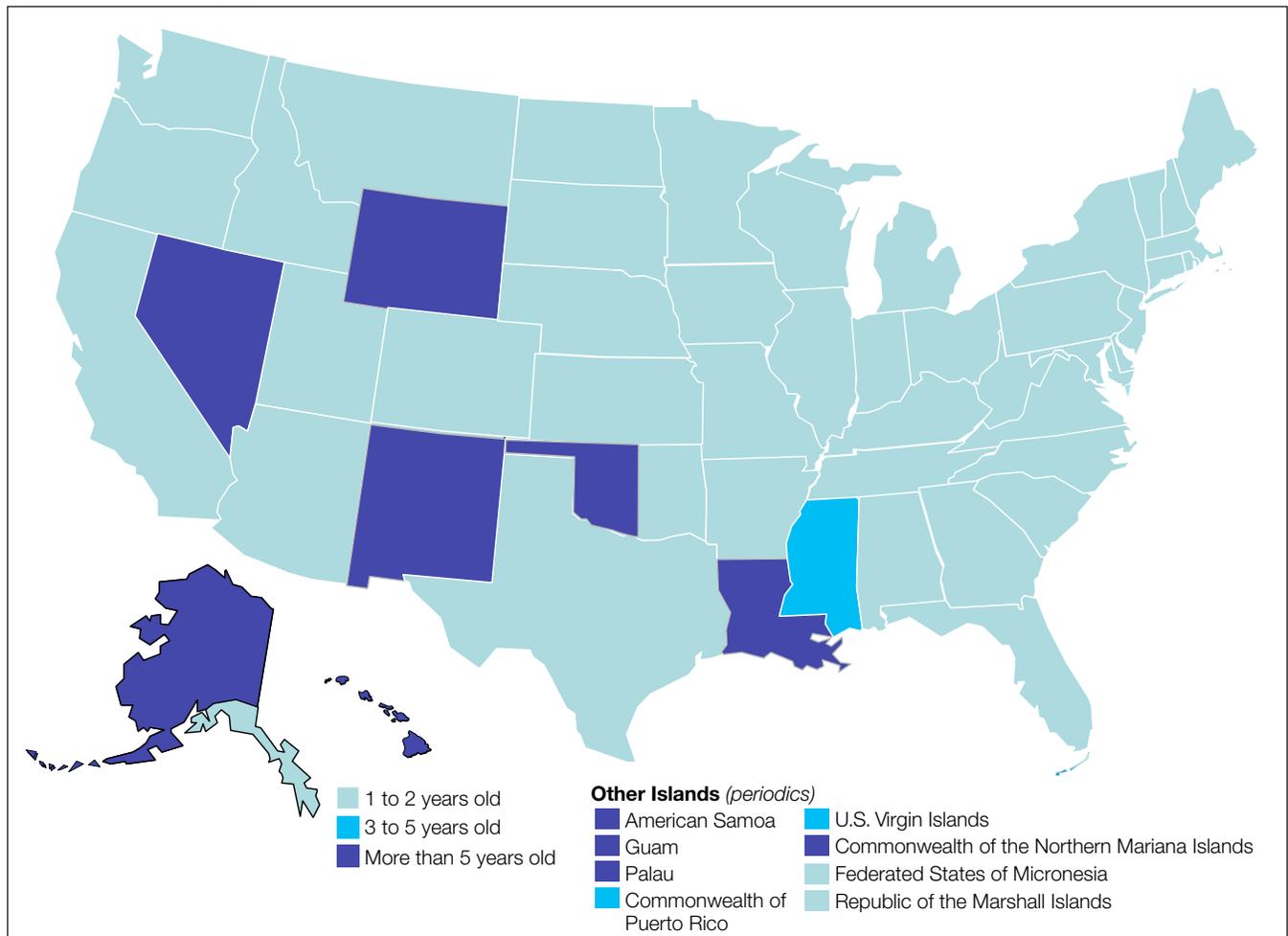
major cost-sharing partners tend to be Federal land managers, particularly the National Forest System (NFS) branch of the Forest Service, which contributed approximately \$0.5 million in additional funds to add value to the basic FIA program. The increase in State support in FY 2010 shows a strong State commitment to resource monitoring in the face of tough economic times.

FIA Data Availability

The FIA program is designed and intended to provide continually updated, accurate, and reliable information on status and trends in the Nation’s forested resources. Current information is one of the chief interests of FIA customers. Our program objectives include (1) providing annual access to current data for all forested lands sampled as part of the annual inventory system and (2) producing analytical reports for all States on a 5-year cycle.

As we move through the transition to full program implementation, one key performance measure is how well we are satisfying those two objectives. Figure 5 shows, for each State, the age of FIA data accessible in our public database as of the end of September 2010—the end of FY 2010. States with 1- to 2-year-old data—the program objective—are shaded light blue; States with 3- to 5-year-old data are shaded medium blue; and States with data that are more than 5 years old are shaded dark blue. This map shows that progress is being made in all regions of the country. The few States with data older than 2 years are in the South and West. In 2010, the number of “light blue” States was 42 plus coastal Alaska, and the number of “dark blue” States was 5 plus interior Alaska and western Oklahoma. Continued improvements in data processing and the NIMS are now paying dividends by allowing us to catch up with the previous data backlog and move toward a more routine schedule.

Figure 5.—Availability of online FIA data, 2010.



FIA = Forest Inventory and Analysis.

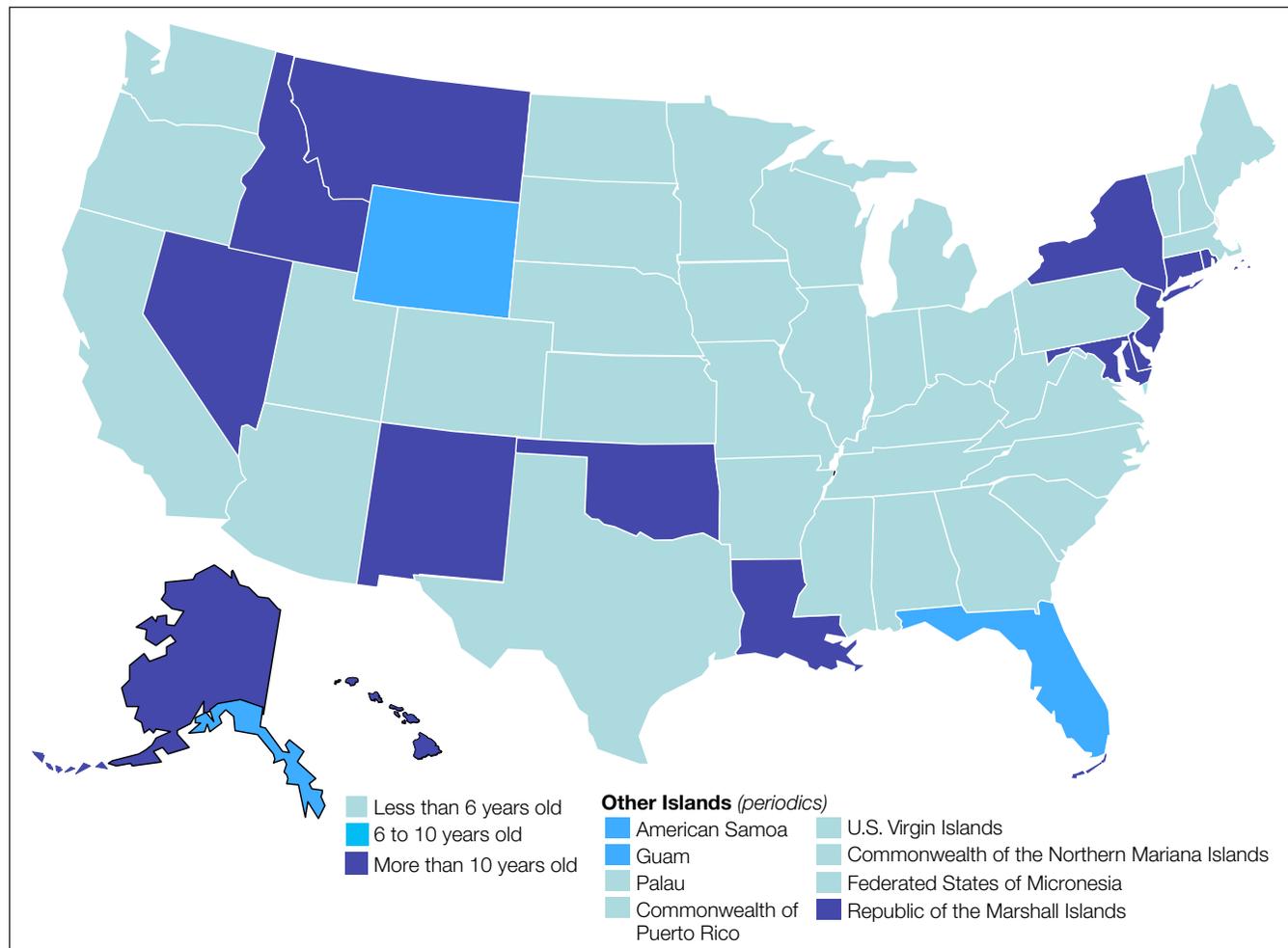
Figure 6 shows, for each State, the age of the most recently published statewide FIA report. States with publications based on data less than 6 years old—the program objectives—are shaded light blue. States with publications 6 to 10 years old are shaded medium blue, and States where the most recent publication reports are based on data more than 10 years old are shaded dark blue. The Northern Research Station (NRS) leads the Nation in States having reports based on data that are less than 6 years old, with 18 of 24 States. The Southern Research Station (SRS) is second, with 10 of 13 States having reports based on data that are less than 6 years old; the Pacific Northwest Research Station is third, with 3 of 5 States; and the Interior West (Rocky Mountain Research Station) is fourth, with 3 of 8 States.

Quality Assurance

The FIA program is committed to producing and delivering complete, accurate, and unbiased information of known quality. The Quality Assurance (QA) program supports this goal through a framework that promotes consistency through all stages of the national core FIA inventory process to ensure the collection, compilation, summarization, and delivery of quality data products with known precision, completeness, representativeness, comparability, and accuracy.

The National Quality Assurance Coordinator provides direction and coordination for the FIA QA program. The QA Coordinator works with the Washington Office and the regional and national indicator advisors to assist with QA issues in the program.

Figure 6.—Publication status of State reports, 2010.



The FIA Program promotes process transparency and consistency by extensively documenting methods and procedures, including—

- A draft pre-field document defines a nationally consistent process to collect information about FIA plots before field visits.
- Up-to-date National CORE Field Guides ensure consistent collection of CORE program data items.
- The field QA check procedures guide promotes field QA consistency from region to region.
- The *FIA Database Description and Users Guide*, version 4.0, provides detailed information to users about published FIA data.
- Staff support for ongoing effort to fully document NIMS.
- The analytical QA Guide outlines steps for checking compiled data for accuracy and completeness before releasing them to the public. This guide promotes analytical QA consistency across regions.

- A cataloged collection of unpublished FIA procedures with Forest Service Intranet interface is under development.

New and ongoing FIA QA tasks in FY 2010 designed to identify errors and increase consistency in the national inventory include—

- Testing and distributing QA Tools to FIA State analysts nationally. QA Tools is a desktop tabling and graphing application that FIA analysts use to examine data for errors before public posting.
- Developing FIA database (FIADB) QA with systematic edit checks of periodic and annual FIA data.
- Defining rigorous national cold check field and scoring procedures to allow equivalent field-crew assessment across regions and crew types.
- Documenting and implementing national data collection staff training standards.
- Developing and documenting NIMS-CS, a consolidated FIA data processing system.



Fiscal Year 2010 Regional Accomplishments

This section provides information on FIA results, accomplishments, and outcomes throughout the country by FIA unit. Those wanting more detailed information may either go to provided links or contact the respective FIA unit (contact information for each FIA unit can be found on the inside back cover of this report).

Pacific Northwest FIA

Finding: A lichen community shifts in response to changes in atmospheric nitrogen (N): ecologically important species decline and weedy species increase. Data from the FIA Lichen Communities Indicator were used to define the first critical loads (CLs) for N deposition in Pacific Northwest forests.

Accomplishment: CLs are “the quantitative exposure to one or more pollutants below which significant harmful effects on sensitive elements of the environment do not occur, according to present knowledge” (Nilsson and Grennfelt 1988). CLs provide benchmarks of ecological harm that guide pollution permitting and regulation. Epiphytic lichen communities are highly N-sensitive, which means lichen-based CLs identify deposition targets that should convey ecosystem-wide protection. We analyzed how lichen communities relate to N inputs using a combination of linear regression and multivariate models. We defined “harm” as a 20- to 40-percent decline in contribution of ecologically important sensitive lichen species to species richness, which corresponds to CLs of 3-9 kg N ha⁻¹ y⁻¹. Forests exceeding this CL also characteristically see a 3- to 4-fold increase in the contribution of “weedy” N-loving species to lichen diversity.

Nilsson, J.; Grennfelt, P., eds. 1988. Critical loads for sulphur and nitrogen. Report 1988: 15. Copenhagen, Denmark: Nordic Council of Ministers.

Outcome: We expect this research will be integral to all forthcoming Integrated Science Assessments conducted by the U.S. Environmental Protection Agency for establishing secondary standards for N-compounds. Managers may use these CLs to set and negotiate target pollutant loads for lands under their charge (i.e., Air Quality Related Value in Federal Class 1 areas).

Contact: Jovan, S., sjovan@fs.fed.us.

Partners: FIA program, Pacific Northwest Research Station; Forest Service Pacific Northwest Region Air Resource Management Program; Laboratory for Atmospheric Research, Washington State University.

Finding: Landsat time-series enables national-level estimates of continental rates of biomass loss and accumulation as a result of forest disturbance and regrowth.

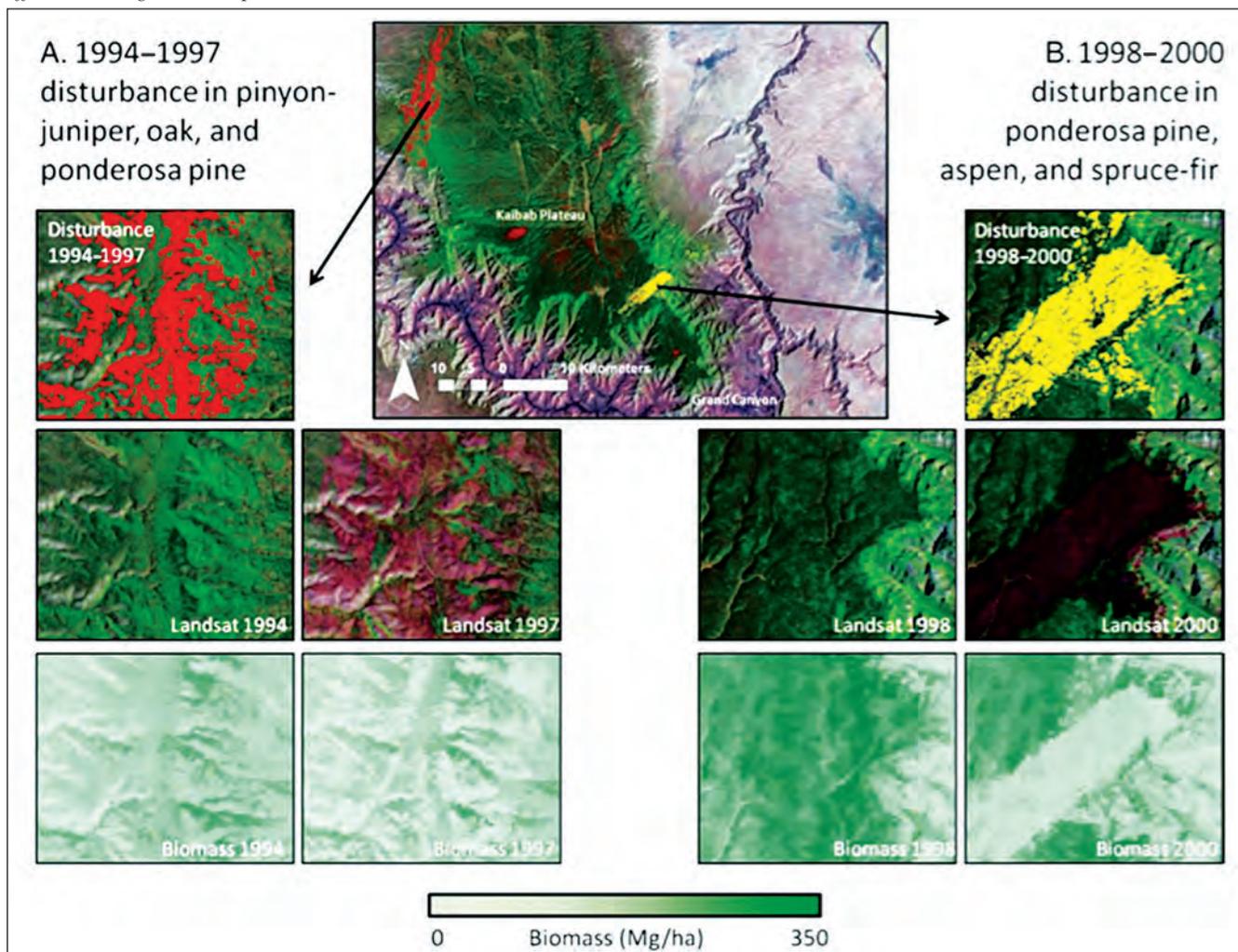
Accomplishment: Spatially and temporally explicit knowledge of biomass dynamics at broad scales is critical to understanding how forest disturbance and regrowth processes influence carbon dynamics. We modeled live, aboveground tree biomass using FIA field data and applied the models to 20+ year time-series of Landsat satellite imagery to derive trajectories of aboveground forest biomass for study locations across the conterminous United States. Maps of biomass dynamics were integrated with maps depicting the location and timing of forest disturbance and regrowth to assess the biomass consequences of these processes over large areas and long time frames. Applying these techniques to a large sample of Landsat scenes across North America facilitates spatial and temporal estimation of biomass dynamics associated with forest disturbance and regrowth, and aids in deriving national-level estimates of biomass change in support of the North American Carbon Program (fig. 7).

Outcome: The derivation of biomass trajectory maps to a large sample of Landsat time-series across the conterminous United States enables a first approximation of continental rates of biomass loss and accumulation as a result of forest disturbance and regrowth. Scientists from a variety of universities and Government agencies that model carbon dynamics, both to parameterize and validate their models, are using this information. In addition, policymakers and managers now have information to use to better understand how forest biomass has changed over the past 20 years. This information will inform their decisions about how forest management affects biomass change today and in the future.

Contact: Cohen, W.B., wcohen@fs.fed.us.

Partners: Montana State University, National Aeronautics and Space Administration (NASA) Goddard Space Flight Center, Northern Research Station, Oregon State University, Rocky Mountain Research Station, University of Maryland.

Figure 7.—Example from the Kaibab Plateau, Arizona (Landsat path 37/row 35), of disturbances in higher biomass ponderosa pine forests (yellow) versus disturbances in lower biomass pinyon-juniper forests (red), shown along with predisturbance and post-disturbance Landsat imagery and biomass predictions. The difference in predisturbance biomass accounts for the divergence seen in the figure between the moderate amount of area disturbed in the 1998–2000 interval and the relatively high amount of biomass affected during that time period.



Finding: FIA plot data were used in conjunction with Landsat imagery to map forest age across California, Oregon, and Washington to help model regional forest carbon dynamics.

Accomplishment: Forest age is a key factor controlling carbon dynamics in forested systems. Because of this, ecosystem process models that describe carbon dynamics need forest age and related structure as inputs. For spatially explicit models, age maps are used to establish quantities and trends of aboveground live and dead biomass, rates of autotrophic and heterotrophic respiration, and other critical controls of carbon

flux. We used two alternative field samples to derive empirical models relating forest age to Landsat spectral metrics: the FIA systematic forest inventory plot data and a smaller, purposive set of plots deliberately selected to represent pure conditions along predefined structural gradients. Models built with the purposive set of plot data resulted in lower plot-level mapping error and higher apparent explanatory power than those built with the systematic inventory data. However, age predictions derived from models built with the purposive data set displayed a bias compared with those built with the larger, more generalized inventory data. A modeling exercise, wherein mapped forest age was translated into carbon, demonstrated

how nonlinear ecological models can magnify these prediction biases over landscapes. From this study, it is clear that for mapping purposes, inventory data are superior to project-specific data sets if those data sets are not representative of the full region over which mapping is to be done.

Outcome: The derivation of age maps for the three West Coast States facilitated a comprehensive assessment of carbon dynamics for the region within the context of the North American Carbon Program. The project combined the three most common approaches to assess spatial carbon budgets: bottom-up and top-down modeling and biometric inventories. These strategies were compared to reduce uncertainty in understanding carbon sources and sinks and to determine the effects of disturbance and climate variability on regional carbon balances of Oregon, Washington, and California over the past decade.

Contact: Cohen, W.B., wcohen@fs.fed.us.

Partner: Oregon State University.

Interior West FIA

Finding: FIA data can be used to identify tree- and stand-level conditions that promote the presence of the fungus *Phellinus tremulae* in aspen stands found in the Interior West (IW).

Accomplishment: Aspen (*Populus tremuloides*) is the most widely distributed tree species in North America and provides an important habitat to a variety of organisms. Aspen is an important habitat for breeding birds, especially in the western contiguous United States, where it often provides food, cover, and nesting habitats disproportionate to its frequency on the landscape. Many of the bird species that breed in aspen forests are part of a system involving primary-cavity excavators, secondary-cavity nesters, and aspen infected with the fungus *Phellinus tremulae*. This fungus causes heart rot in the base and stem of a tree without immediately killing it. Trees with heart rot are preferred nest sites for a variety of cavity-nesting bird species. To predict the presence and frequency of *P. tremulae*, IW-FIA data were used to compare tree and stand characteristics in a study area comprising the eight Interior West States. To assess the potential value of external ocular cues to infection, ages of trees showing external signs of infection (conks) were compared with infected trees that showed no external signs. Differences in stand purity, stand age, crown cover, and site quality between infected and uninfected forest stands containing aspen trees were also explored.

Outcomes: A strong relationship was found among tree age, tree diameter, and compacted crown ratio with infection frequency in trees. Aspen with greater stand purity, more canopy cover, and older stand ages had greater occurrence of the fungus. Of the three variables, stand age was the most powerful for predicting infection at the stand level. Data also show that infection rates in the study area were lower than in other parts of aspen's range, and that the average size of infected trees was smaller in the study area than those reported elsewhere. These results have important implications to management of aspen for wildlife, especially for birds that use decayed aspen for nesting. From a forest management perspective, one could use the results of these analyses to predict which aspen stands are best at providing habitats for cavity-nesting birds, and to estimate how much potential habitat currently exists on the landscape.

Contact: Witt, C., chriswitt@fs.fed.us.

Partners: Utah Division of Wildlife Resources, Utah State University.

Finding: Pilot tests inform prototype-mapping decisions for the 2011 National Land Cover Dataset.

Accomplishment: The Multi-Resolution Land Characteristics (<http://www.mrlc.gov/>) consortium has developed plans for the 2011 National Land Cover Dataset (NLCD), which will include an approximate Anderson Level II classification, percent impervious surface, and percent tree canopy cover (TCC). A spatially explicit representation of live TCC is a valuable tool for many applications, such as defining forest land, delineating wildlife habitat, estimating carbon, and modeling fire risk and behavior. Because land characterization is central to its business needs, the Forest Service has assumed responsibility for this component and will be developing this TCC layer. Recently, a national pilot project was completed by the FIA Program's national Techniques Research Band. This pilot included study sites in Utah, Oregon, Georgia, Michigan, and Kansas, and was designed to test the use of high-resolution photography acquired through the National Agriculture Imagery Program (NAIP), coupled with extensive ancillary data layers through alternative sampling and modeling methodologies in support of this TCC mapping commitment.

Outcomes: A number of studies have already resulted from this pilot, and they are led by a variety of authors in partner groups throughout the United States. Five studies, led by IW-FIA staff in collaboration with the broad partner group, addressed questions regarding sampling and modeling alternatives for the upcoming NLCD TCC map. The first study compared measurements of canopy cover derived by photo-interpretation of NAIP

imagery with measurements derived from field-measured tree data collected on FIA plots. Differences between these measurement alternatives illustrated the effect that shadowing and other anomalies could have on some canopy estimates derived from the photos. The second study also compared alternative methods for estimating live TCC, including measurements from the field, modeled-field estimates, ocular image segmentation, and dot-count assessments from digital aerial photography. The strengths of NAIP photography for measuring TCC are illustrated, but the importance of training is emphasized. In a third study, repeatability among photo-interpreters and its effect on the models of TCC were explored for each of the pilot areas. Analyses and simulations led to recommended photo-interpretation tolerance and compliance rates for production mapping, again with an emphasis on the importance of training. The fourth study explored the intensity of photo plots necessary to develop reliable predictive models of TCC, concluding that the sampling intensity of the FIA grid may be sufficient for NLCD mapping purposes. Finally, the pilot data were analyzed to help inform decisions regarding appropriate modeling mapping units for the country. Recommendations were made to simplify modeling processes and substantially increase mapping unit size from previous nationwide mapping efforts, thus increasing the number of training points per model, decreasing the cost of the process, minimizing seam lines, and simplifying validation efforts.

Contact: Moisen, G., gmoisen@fs.fed.us.

Partners: Northern Research Station, Pacific Northwest Research Station, Remote Sensing Applications Center, Research and Development Quantitative Sciences, Southern Research Station, State and Private Forestry Forest Health Protection.

Finding: FIA data show that structural and compositional diversity has little effect on stand productivity.

Accomplishment: The diversity-productivity hypothesis is a commonly held theory that suggests that plant community productivity is higher where species diversity is higher. A similar theory has been suggested for monotypic communities that have structural diversity. Both aspects of this hypothesis are difficult to test in forest stands because the necessary conditions are difficult to replicate in controlled field trials. Experimental tests have been largely limited to plots of herbaceous vegetation. As a result, the body of evidence in forest stands has not yielded a definitive answer. The experimental limitation was overcome by analyzing data from approximately 1,500 ponderosa pine (*Pinus ponderosa* C. Lawson) stands in the Western United States using FIA data. Relative density and height and site quality were combined in a conceptually sound

expression of the relationship between growth and growing stock for ponderosa pine-dominated stands of relatively simple structure (i.e., pure, even-aged). Predictions from this model were compared with the productivity of more compositionally and structurally diverse stands—i.e., mixed even-aged, mixed uneven-aged, and pure uneven-aged. Results are consistent with a common observation in forest production ecology: stand growth is not strongly influenced by either compositional or structural diversity.

Outcomes: This research provided the first broad-scaled test of the diversity-productivity debate in forest stands. Forest management, particularly on public lands, is commonly based on justifications that are included in management plans and silvicultural prescriptions. Although many situations exist in which compositional and structural diversity are desirable—such as to provide certain wildlife habitat characteristics or resilience under the threat of insects or pathogens—increasing diversity for the purpose of increasing productivity does not appear to be justified. Any ecological benefits of compositional and structural diversity should be considered independently of production.

Contact: Shaw, J.D., jdshaw@fs.fed.us.

Partners: Utah State University.

Southern FIA

Finding: Showing the potential for woody biomass as a sustainable biofuel in South Carolina.

Accomplishment: Although interest in bioenergy is growing rapidly, the potential of woody biomass as a sustainable supply for biofuel is still largely unknown. In 2008, the SRS-FIA unit and the South Carolina Forestry Commission (SCFC) completed a cooperative effort to assess the potential for developing a sustainable woody biomass energy industry in South Carolina. The assessment also gave FIA an opportunity to develop a focused report highlighting the use of FIA data in the context of a bioenergy or biomass availability issue. Sources of woody biomass vary, but typically include unused wood residue from both tree harvesting and mill operations, volume from residual forest inventory including poor quality and small-diameter trees, and woody material from urban waste. Assessing biomass availability from these varied sources required synthesizing data from FIA's Timber Products Output (TPO) database, annual forest resource inventories, and SCFC estimates of the urban wood waste entering commercial landfills. In addition, SCFC surveyed South Carolina loggers and timber producers to

determine the range of prices per delivered ton needed to make the harvest, processing, and transportation of logging residue and residual trees economically viable. The timber producers also provided estimates of the amount of biomass they could potentially produce at different prices per ton.

Outcome: A range of \$20 to \$30 per ton was established from responses to timber producer surveys. The estimates of potential available biomass from all sources distributed across these price points ranged from 4.8 to 16.5 million tons per year for South Carolina. Study results showed that although 7.7 million tons were currently committed to other uses, the 8.8 million tons of unused material produced annually could be used to sustain new wood-based bioenergy facilities without increasing current harvest levels and without overly affecting the State's existing forest industries.

Conner, R.C.; Adams, T.O.; Johnson, T.G. 2009. Assessing the potential for biomass energy development in South Carolina. Res. Pap. SRS-46. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 19 p.

Contacts: Conner, R., rconner01@fs.fed.us; Johnson, T., tjohnson09@fs.fed.us.

Partners: Tim Adams, South Carolina Forestry Commission.

Finding: Historic FIA data converted to current FIA database structure and posted on line.

Accomplishment: With the increasing interest in climate change, FIA data has been evaluated as a possible tool to answer questions regarding the change in forests. Previously, the only option was to extract the information from published reports, and often the exact information needed was not published in the format needed to answer the questions of interest.

Older periodic FIA data from all SRS States, excluding Kentucky, was posted to FIADB 4.0 in 2010. The added data are a culmination of work done by multiple FIA employees from SRS and the NRS-FIA units over the past 10 years. In addition to having posted the older periodic data, the employees have replaced the most recent periodic prism plot inventories that were already available in FIADB 4.0 format. They made enhancements by adding growth, removals, and mortality (GRM) estimates on all live trees. Previously, only the growing-stock and saw-log components were available for GRM rate estimation. In addition, some attributes that were missing from FIADB were added, specifically tree height and treatment codes. Finally, in some older Southern States, the population level tables were refined to better match the expansion factors used in the original estimates.

Outcome: As of 2010, older SRS-FIA data have been converted to the current national FIA database structure: NIMS 4.0. In addition, these data have been posted on the national FIA Web site (<http://www.fia.fs.fed.us/tools-data/default.asp>), so that they can be accessed on line. This conversion to the current FIA database structure allows data users to access current online tools to query SRS-FIA periodic data. As a result, FIA data users can conduct trend analyses across multiple inventory years and unit boundaries. Users should be aware that all estimates provided by national FIA data tools for all periodic prism plot data are for timberland only. They do not include estimates on reserved forest land.

Inventories available in FIADB 4.0 format and available on line—

Alabama:	1972, 1982, 1990
Arkansas:	1978, 1988, 1995
Florida:	1970, 1980, 1987, 1995
Georgia:	1972, 1982, 1989
Louisiana:	1974, 1984, 1991
Mississippi:	1977, 1987, 1994
North Carolina:	1974, 1984, 1990
Oklahoma (East):	1976, 1986, 1993
South Carolina:	1968, 1978, 1986, 1993
Tennessee:	1980, 1989
Texas (East):	1975, 1986, 1992
Virginia:	1977, 1985, 1992

Contact: Turner, J., jturner02@fs.fed.us.

Finding: Southern Research Station FIA scientists focus on invasive species.

Accomplishment: Nonnative invasive plant species pose a threat to forest resources throughout the Southeast. Many invasive plants have the ability to alter ecosystem characteristics by changing soil chemistry and altering plant community structure, altering disturbance regimes like fire frequency and duration, and changing hydrologic regimes in wetland-associated systems. In addition to the cost of environmental impacts, invasive plant species control efforts cost the United States as much as \$25 billion annually. The SRS-FIA program began monitoring nonnative invasive plant species in 2001 in response to a growing desire to track potential forest health threats on United States forestland. No other program in the United States provides a mechanism for monitoring the spread of common invasive species across both public and private lands on a regularly updated basis. The invasive plants selected for survey are regionally recognized exotic pest plants known to

invade interior forest stands and forest edges, canopy gaps, and stream-sides. FIA collects presence information and estimates of cover for invasive trees, shrubs, vines, grasses, canes, forbs, and ferns.

Outcome: SRS-FIA scientists have used the FIA data combined with independent research to generate products that have received widespread recognition in recent years, including the recognition in August 2010 as one of *Forest Ecology and Management's* "Top 50 most cited papers" from 2007 to 2010. Organizations such as the Society of American Foresters, in their publication *The Forestry Source*, have highlighted invasive plant research, also published in *Forest Ecology and Management*, conducted by SRS-FIA scientists. Other recent products include the development and implementation of invasive species maps, available in print-ready format on line; a report highlighting the expansion of Chinese tallowtree (*Triadica sebifera*) in Texas, Louisiana, and Mississippi, which was featured in multiple media publications, including the Louisiana Public Radio station "Red River Rocks;" along with multiple proceedings papers and posters.

Miller, J.H.; Chambliss, E.B.; Oswald, C.M. 2008. Maps of occupation and estimates of acres covered by nonnative invasive plants in southern forests. [Available only on the Internet: <http://www.invasive.org/fiamaps/>].

Oswald, C.M.; Oswald, S.N. 2007. Winter litter disturbance facilitates the spread of the nonnative invasive grass *Microstegium vimineum* (Trin.) A. Camus. *Forest Ecology and Management*. 249: 199–203.

———. 2010. The facilitation and impacts of *Microstegium vimineum* colonization in an eastern hardwood forest. In: Stanturf, J.A., ed. Proceedings of the 14th biennial southern silvicultural research conference. Gen. Tech. Rep. SRS-121. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station: 103–106.

Oswald, C.M.; Oswald, S.N.; Clatterbuck, W.K. 2007. Effects of *Microstegium vimineum* (Trin.) A. Camus on native woody species density and diversity in a productive mixed-hardwood forest in Tennessee. *Forest Ecology and Management*. 242: 727–732.

Oswald, S.N. 2010. Chinese tallow (*Triadica sebifera* (L.) Small) population expansion in Louisiana, East Texas, and Mississippi. Res. Note-SRS-20. 8p.

Contact: Oswald, C., coswalt@fs.fed.us.

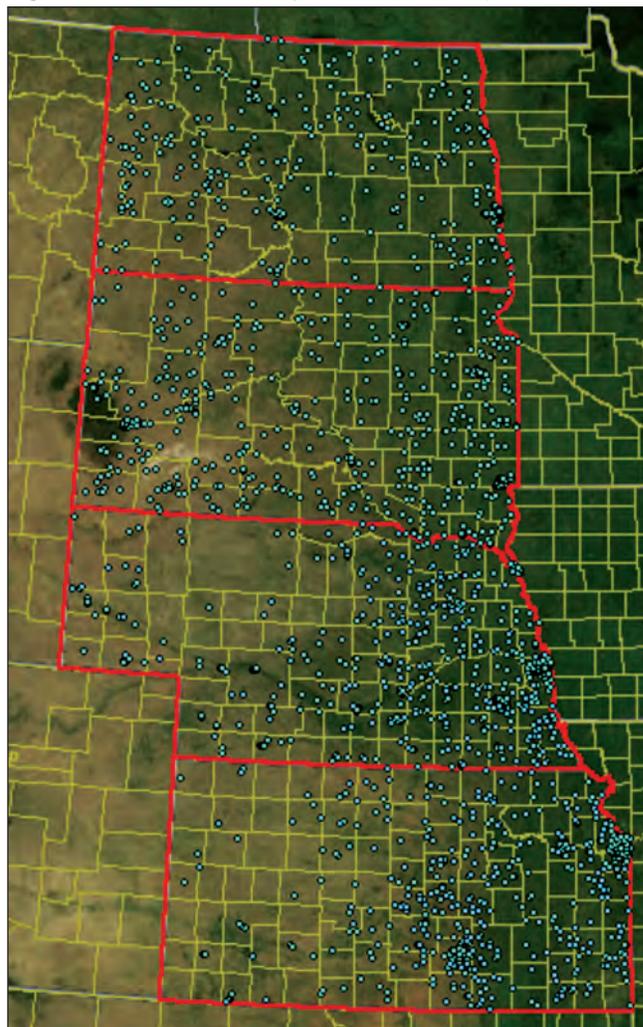
Partners: Jim Miller, RWU SRS-4552—Insects, Diseases, and Invasive Plants of Southern Forests; Southern State forestry agencies.

Northern FIA

Finding: Completion of Great Plains nonforest tree inventory.

Accomplishment: FIA's National Inventory and Monitoring Applications Center (NIMAC), in partnership with cooperators from State forestry agencies in Kansas, North Dakota, Nebraska, and South Dakota, undertook a nonforest tree inventory as part of a joint project called the Great Plains Initiative (GPI). Using a multiphase sampling approach, they collected data on more than 1,500 urban and rural nonforest plots during 2008 and 2009, processed the data, and developed a reporting tool based on FIA's PC EVALIDator tool (fig. 8).

Figure 8.—Great Plains nonforest tree inventory.



Outcome: Results indicate that roughly 3 percent of the area of these States is defined by GPI as being nonforest with trees present (NFT); this is nearly the same as the amount of land FIA defines as forest. NFT areas in these States contain roughly 30 percent of the ash resource. About 35 percent of NFT areas are composed of groups of trees that function as windbreaks—predominantly field windbreaks. The percentage of rural NFT trees that are ash is nearly double that found in urban NFT areas (20 versus 8 percent, respectively). One of NIMAC’s principal goals, as embodied by the GPI study, is to use FIA institutional knowledge to help FIA clients implement nontraditional inventories while developing tools and methods that benefit the program as a whole.

Lister, A.J.; Scott, C.T.; Rasmussen, S. 2009. Inventory of trees in nonforest areas in the Great Plains States. In: McWilliams, W.; Moisen, G.; Czaplewski, R. 2008 Forest Inventory and Analysis (FIA) symposium. October 21–23, 2008; Park City, UT. Proc. RMRS-P-56CD. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 1 CD.

Contact: Lister, A., alister@fs.fed.us; Scott, C., ctscott@fs.fed.us.

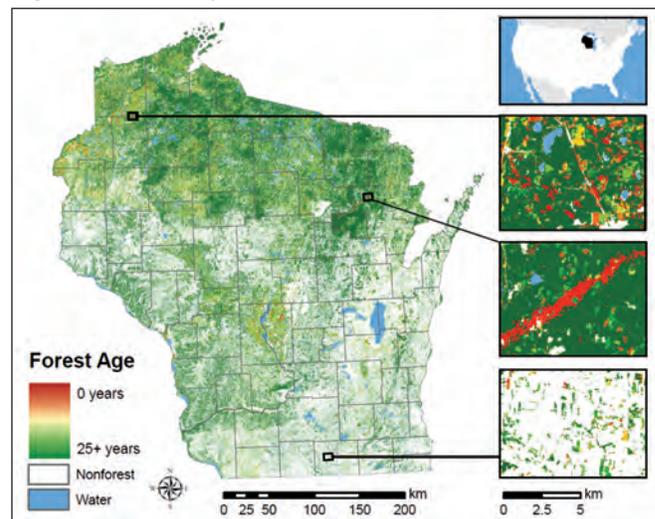
Partners: State forestry agencies in Kansas, Nebraska, North Dakota, and South Dakota.

Finding: Maps of young forests support wildlife conservation.

Accomplishment: Young forests provide habitat for many species of wildlife. Natural resource specialists in the Upper Great Lakes are concerned about long-term population declines in several early successional wildlife species and their forest habitats. Research scientists from the NRS-FIA program are studying the abundance, distribution, and change in young forest habitats across Michigan, Minnesota, and Wisconsin (fig. 9). In addition to using FIA data, a satellite-image-based approach—based on the NASA-supported North American Forest Dynamics project—was developed for mapping young forests. This approach uses Landsat time series stacks and a vegetation change tracker to identify forest disturbances since 1985. FIA- and map-based estimates of young forest are very similar. The maps complement FIA data by providing additional information about the spatial distribution, location, and size of young forest habitat patches used by American woodcock, golden-winged warbler, Kirtland’s warbler, ruffed grouse, and other wildlife species.

Outcome: Supports wildlife conservation of young forest-associated species.

Figure 9.—*Forest age, Wisconsin, 2009.*



Contact: Nelson, M., mdnelson@fs.fed.us; Perry, H., charleshperry@fs.fed.us; Stueve, K., kmstueve@fs.fed.us; Gormanson, D., dgormanson@fs.fed.us; Huang, C., cqhuang@umd.edu.

Partners: University of Maryland.

Finding: Special forest inventory data request for Secretary Vilsack.

Accomplishment: In September 2010, at the request of Secretary Vilsack’s office, the FIA program provided forest statistics for use in a new information tool being developed by the USDA that will identify renewable energy opportunities at the national, State, and county levels.

Opportunities can be identified for feedstock production, renewable energy production, and for renewable energy use. This information tool will be based on a tremendous amount of data and will be developed in stages. Initially, the focus will be on transportation fuels, but it will expand in later stages to include heat and power, wind, solar, and other renewable technologies. USDA would like to construct a data set that would provide key information to the Secretary at the county level for key forest attributes (fig. 10). Particularly, information that could support analysis of the potential of forests to provide ecosystem services such as energy.

The data set was summarized at the plot/condition level for a six-State target area (Arkansas, Iowa, Kansas, Oklahoma, South Carolina, and Tennessee). The data can then be summarized by county for specific needs.

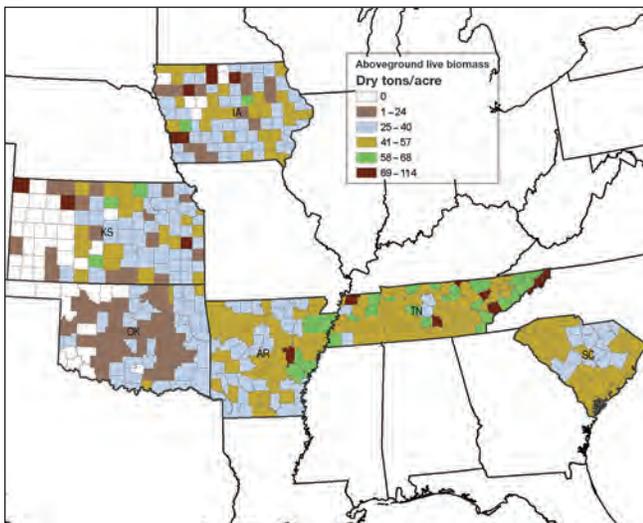
Plot level variables—

1. State name.
2. County name.
3. FIP code (2-digit State code plus 3-digit county code).
4. Forest area (acres).
5. Ownership (NFS, Other public, Private).
6. Productivity class (cubic feet per acre per year classes).
7. Forest class (Productive unreserved natural, Productive unreserved planted, Reserved, Roadless, Unproductive unreserved).
8. Forest type (Pine, Spruce-fir, Other softwoods, Lowland hardwoods, Upland hardwoods, Nonstocked, and Other).
9. Net growing stock volume (cubic feet).
10. Net growing stock growth (cubic feet).
11. Aboveground live tree biomass (dry U.S. tons).
12. Logging residues (dry U.S. tons), one record only for total residues per county (not plot level data).

Outcome: The Secretary of Agriculture’s Office will be able to derive per-acre values by dividing variable total in a class (volume, biomass, etc.) by acres in the selected class (ownership, forest class, forest type, etc.).

Contact: Miles, P.D., pmiles@fs.fed.us; LaPoint, E., elapoint@fs.fed.us; Smith, W.B., bsmith12@fs.fed.us; Buford, M., marilyn.buford@usda.gov.

Figure 10.—Aboveground live tree biomass by county for target area (based on FIA data supplied to Secretary Vilsack’s office).



FIA = Forest Inventory and Analysis.

Partners: Babcock, A., alexandra.babcock@ocio.usda.gov; Baumes, H., hbaumes@oce.usda.gov; Bower, S., Shelley.bower@ocio.usda.gov; Hernandez, T., tony.hernandez@ocio.usda.gov.

National Office

The National Office of the FIA program helps to guide and coordinate the FIA field units engaged in implementing the enhanced FIA program. Most of the National Office accomplishments include making presentations, preparing policy white papers and budget justifications, and providing input to reports for national and international organizations.

In FY 2010, the National Office staff—

- Provided budget coordination, briefings, and guidance for FIA field units.
- Facilitated one FIA management team meeting, six conference calls, and dozens of briefings for internal and external partners, customers, collaborators, and supporters.
- Collaborated with the Society of American Foresters and assisted in the organization of the ninth national user-group meeting for FIA customers, which was held in Sacramento, CA, in March 2011.
- Published the *FIA Fiscal Year 2009 Business Report*.
- Continued collaboration with the Bureau of Land Management (BLM) and the Natural Resources Conservation Service (NRCS) to design common protocols for strategic rangeland monitoring.
- Continued working with the Conservation Biology Institute (CBI) in Corvallis, OR, to develop and improve the Protected Areas Database. Provided membership on a new steering committee made up of CBI, Forest Service, U.S. Geological Survey, and The Nature Conservancy to develop an “official” protected-areas database for the United States.
- Completed final prepublication edits of core indicator chapter for the *National Report on Sustainable Forests—2010* and the glossary of terms for the report.
- Continued providing support for coding and testing the National Vegetation Classification System algorithm for use with FIA data, in cooperation with FIA by NatureServe.

-
- Continued to work with the United Nations/Food and Agriculture Organization on implementing the Global Remote Sensing Project to estimate and monitor area changes of the world's forests.
 - Began collaborative work with NASA on land-cover and land-use tracking in the United States.
 - Participated in SilvaCarbon, a flagship program under United States fast start financing for Reducing Emissions from Deforestation and Forest Degradation Plus (REDD+) and a U.S. contribution to the Forest Carbon Tracking task of the intergovernmental Group on Earth Observations.
 - Wrote a journal paper on the status and progress of large-scale assessments of the productive capacity of forest ecosystems in the United States. (*Journal of Forestry* Manuscript JF-10-025, accepted for publication in 2011.)
 - Delivered a presentation to the North American Forestry Commission Board of Alternates in Guadalajara, Mexico, on the North American database and held discussions with Forest Service Chiefs of the United States, Canada, and Mexico on issues related to global forest assessment reporting.
 - Presented a seminar on forest inventory in the United States to the Sloan Foundation in New York City.



FIA Data Requests and Access

The FIA Spatial Data Services (SDS) Team provides spatial data services to clients and operates as a virtual Spatial Data Services Center (SDSC) with staff located throughout the country. SDSC staff consists of—

- Liz LaPoint—Team Lead, Northern National projects.
- Rich McCullough—Northern Research Station FIA.
- Sam Lambert—Southern Research Station FIA.
- Jock Blackard—Interior West FIA.
- Dale Weyermann and John Chase—Pacific Northwest FIA.

News, Changes, and Updates

SDSC continues to work with partners through memoranda of understanding (MOUs) when a clear need exists. Some of these partners include the University of Maryland, the Woods Hole Institute, NASA’s Goddard Space Flight Center, the University of New Hampshire, the University of Wisconsin, and The Nature Conservancy. Other partnerships include those between FIA and the NFS, the Forest Service Remote Sensing Applications Center, and the Forest Service Forest Health Technology Enterprise Team.

The SDS Team continues development of the SDSC. The toolkit ensures more consistent access to products from SDSC personnel across the FIA units. The toolkit was presented by Forest Service Geospatial Technologies at the ESRI User

Conference in San Diego, CA, in 2010. Refinement and updating is needed for use with ArcGIS 10.

FY 2010 Spatial Data Requests

In FY 2010, 423 requests were active, up from the 405 active in 2009 (fig. 11). National or multiregional data requests accounted for 14 percent of the total number of requests. Of the received requests, 98 percent were completed by the end of the fiscal year and 4 percent remain in progress. The remaining 3 percent were either canceled by the client, put on hold by the client, or the client has not remained in contact with SDSC.

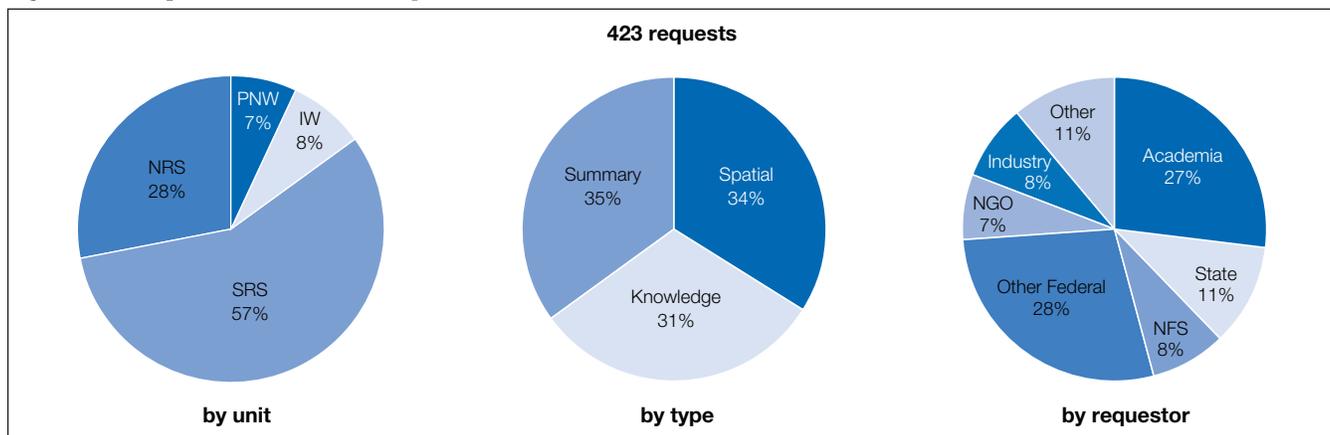
Request types have been shifting in recent years from knowledge types to summary and spatial type requests (fig. 11). Knowledge requests may have declined as users become more familiar with the online data sets and online data tools.

Academia continues to be SDSC’s largest client, with 27 percent of all new requests (fig. 11). The NFS and other Federal groups have increased their usage of spatial data services from 4 and 15 percent to 8 and 28 percent, respectively.

Web Tools Surpass 100,000 Retrieval Mark in FY 2010

The FIA program began providing Internet database retrieval programs in 1996 with the introduction of the FIA Data Base Retrieval System (DBRS). The DBRS allowed the public to

Figure 11.—Requests made to the FIA Spatial Data Services Center in 2010.



FIA = Forest Inventory and Analysis. IW = Intermountain West Research Station. NFS = National Forest System. NGO = nongovernmental organization. NRS = Northern Research Station. PNW = Pacific Northwest Research Station. SRS = Southern Research Station.

query regional FIA data sets in Eastwide/Westwide format. In 2002, the Forest Inventory Mapmaker program was introduced, allowing the public to generate estimates from national FIA data in the newly created FIADB. The current generation of data retrieval programs produces estimates and their associated sampling errors. Forest Inventory Data Online (FIDO) was introduced in 2008 and the EVALIDator Web application was introduced in 2009. Based on analysis of Internet protocol addresses, these Web applications are used by a variety of users: academia (15 percent), Government (25 percent), non-governmental organizations (NGOs)/international (1 percent), commercial (14 percent), and indeterminate (45 percent). In FY 2010 online retrievals exceeded 100,000 for the first time (table 3).

In 2009, a Web application was developed that allowed querying of the National Woodland Owner Survey (NWOS) database. Nearly 10,000 retrievals have been completed using the NWOS Tablemaker.

The FIA DataMart was revised in 2009 to include the ability to download FIADBs by State as Microsoft Access database files. The Access databases contain a reporting tool (the EVALIDator-PC) that allows the user to generate reports. These reports are not included in table 2 but undoubtedly run into the thousands or tens of thousands. In FY 2009, users downloaded 2,014 State databases in Access files. In FY 2010, users downloaded 3,033 State databases.

The FIA DataMart also allows the user to download data as text files. In FY 2010, users downloaded 89,980 text files containing data from an FIADB table. In that same year, users downloaded 18,026 zipped files that contained data from one or more FIADB tables.

In 2003, the FIA Mapmaker program added a module that allowed the user to download FIA data in Forest Vegetation Simulator (FVS) format. This feature was temporarily lost with the retirement of the Mapmaker program in 2009. FVS format is now available through a tool developed by the Forest Management Service Center. The FIA2FVS program is used to extract data fields from the FIADB into a FVS ready database. The FIA2FVS program can be downloaded from <http://www.fs.fed.us/fmsc/fvs/software/preprocessors.php>.

The National Reporting and Data Distribution (NRDD) team is providing Webinars and in-person trainings on our Web tools. In FY 2010, the team provided one Webinar and three trainings. More Webinars are scheduled for FY 2011. FIA has also been performing outreach by attending meetings as vendors. The NRDD team is involved in staffing the booth and it distributes information about FIA data during those meetings.

A historic summary of FIA data access and spatial requests is provided in table 3 and in appendix table C-7.

Table 3.—Number of database retrievals using FIA Web applications by fiscal year.

	Fiscal year								
	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of retrievals	11,579	14,973	26,548	56,475	24,335	26,615	59,609	90,974	101,643

FIA = Forest Inventory and Analysis.

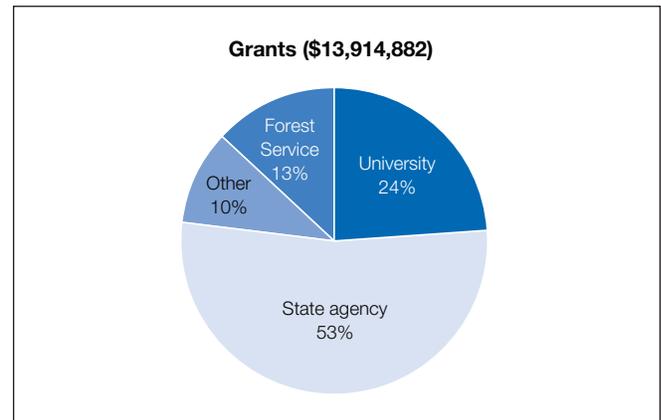
Grants and Agreements

Each year, FIA units enter into various grants and cooperative agreements with partners to accomplish specialized work in support of the FIA mission. In some cases, partners provide expertise that is not available within the FIA program; in other cases, they share the workload. Appendix table C-5 lists 98 grants and agreements funded in FY 2010, comprising \$13,914,882, or approximately 19 percent of the total available FIA program budget. This amount is an increase of \$972,496 from those that were awarded in FY 2009. This number fluctuates from year to year, but demonstrates the reliance of the FIA program on collaborating with external partners to get work done efficiently. Most of these grants and agreements were with State agency (53 percent of funds) and university partners (24 percent of funds) (fig. 12).

Additional cooperators included other Federal and Forest Service offices (13 percent of grants) and other non-Federal partners (10 percent of grants). The major purpose for all grants was for collaboration in data collection, information

management, and research in techniques development. We expect to continue to make significant use of grants and agreements to augment FIA staff capacity in the analysis and reporting of annual FIA data for individual States.

Figure 12.—Grants and agreements by recipient group, 2010.





Consultations by FIA Staff

Consulting with FIA customers is a growing part of our business. Just as we have increased the amount of information (both data and analyses) made available on our Web site, our FIA staff are increasingly in demand by customers seeking either to understand more about the FIA program and our results, or seeking to address a specific question not obviously addressed through other means. Questions pertaining to a single administrative unit (e.g., to a single State or to a single national forest) often are referred to partners within that administrative unit (e.g., State foresters, national forest analytical staff) who can often provide better context and who prefer to maintain their contacts with their customers. When questions span multiple administrative units, FIA staff will try to help the customer find an answer. FIA does not compete with private sector consultants; rather, we answer questions about our methods and help customers (including private consultants) use FIA data to answer their own or their client's questions. Appendix table C-6 shows the number of significant consultations that FIA staff provided in FY 2010, by unit and by type of customer. A significant consultation is defined as any dialogue with a customer outside of FIA that requires more than a single hour to address, and which is not part of our normal course of business in collecting, analyzing, and reporting on FIA information.

All together, FIA staff addressed 991 significant consultations, which required 10,381 staff hours to complete (table 4)—equivalent to 5 full-time staff-years. Forty percent of the time and 395 of the consultations were conducted with other Government agencies, such as State agencies and other Federal agencies, as well as having internal discussions within the Forest Service. Other major client groups included academic clients (approximately 31 percent of the consultations and 17 percent of the time), industry (8 percent of the consultations and 5 percent of the time), and NGOs (9 percent of the consultations and 13 percent of the time). The data also show some regional variations. For example, although Government organizations (largely State agencies) are the major clients throughout the country, industry and academic customers are secondary major clients in the East (appendix table C-6).

Table 4.—Number and hours of significant consultations by FIA staff by customer group, FY 2010.

Customer group	Number	Hours
Academic	306	1,729
Government	395	6,145
Industry	83	539
NGO	89	1,338
NIPF	14	90
Media	11	65
Other	93	475
Total	991	10,381

FY = fiscal year. NGO = nongovernmental organization.
NIPF = non-industrial private forest.



National Inventory and Monitoring Applications Center

The National Inventory and Monitoring Applications Center was formed in 2006 during the merger of the North Central and Northeastern Research Stations. Although NIMAC is part of the NRS FIA Program, it is responsible for providing national technical assistance to FIA customers on planning, conducting, processing, and analyzing forest inventories.

- Intensifying FIA field plots on State lands in Indiana, Missouri, and Wisconsin.
- Intensifying FIA field data on national forest lands in most NFS regions.
- Identifying potential effects of emerald ash borer in the Great Plains.
- Providing technical assistance to Forest Service International Programs (IPs) on REDD+. Recent involvement included Peru, the Democratic Republic of the Congo, and Honduras. Forest Service IPs, the U.S. Agency for International Development, and other outside sources pay for this assistance.

National Forest Collaboration

In FY 2002, the Deputy Chief for R&D and the Deputy Chief for NFS signed an internal MOU providing for permanent inclusion of all national forest lands within the FIA program. This was a significant step forward for FIA customers, guaranteeing the availability of consistent FIA information across the entire United States. Under the terms of the agreement, the national forests provide permanent funding to help cover the cost of the FIA program on National forest lands, and, in return, the FIA program agrees to implement the program in a manner consistent with other forested lands within the same State and to load FIA data into the national forest vegetation database for use in forest planning and other broad-level assessments. FIA will also provide advice and assistance in developing forest-level sampling protocols linked to FIA, and collaborate with national forests that want to contribute additional resources for additional sampling.

NFS is funding FIA's NIMAC group to develop the Design Tool for Inventory and Monitoring to help guide intensification and other monitoring efforts, and the Analytical Tool for Inventory and Monitoring to analyze the resulting data as well as existing FIA data in a form that better suits NFS needs. Forest Service Regions 8 and 9 are working with NIMAC to

determine intensification levels on each of their forests. All of Region 9 will be intensified two- or three-fold. Regions 8 and 9 will fund a position in NIMAC beginning in FY 2011. The Tongass National Forest in Alaska funded NIMAC to provide assistance on several monitoring projects, mostly focusing on how to maximize the use of FIA data using NIMAC software. Recent collaborative efforts between FIA and NFS may be reviewed on line at <http://www.fia.fs.fed.us>.

Regions 5 and 6 continue to work with the Pacific Northwest Research Station (PNW) to intensify the sample and collaborate in crew training, contract administration, and data collection. Region 1 and 4 have collaborated with Interior West-FIA to further expand current FIA protocols to include collecting information on all lands, not just the forested portion. Both regions are using an intensification system that integrates with the Interior West-FIA base inventory data and allows the regions to use NFS applications to collect intensified data and store them in the NFS vegetation database.

Based on feedback from the nine NFS regions, FIA is meeting the needs of NFS partners with a few caveats. Additional work is needed in the western regions of the United States, particularly in the areas of coordinating fieldwork and in defining and collecting a consistent set of regional variables on NFS lands to meet NFS needs. More effort needs to be made in getting FIA data from NFS lands into the hands of NFS staff and in developing data presentations, analyses, and reports tailored to the specific needs of NFS managers. FIA will continue to work on these issues in FY 2011. Increasing demands from NFS customers for additional forest planning data and the increased emphasis on forest plan monitoring could require changes in current financial arrangements with NFS. Stronger funding support at the national level, including additional NFS funding for needs beyond the core FIA program, may be needed.

In a meeting with NFS inventory specialists on inputs to the FIA strategic plan, the following issues were raised as NFS priorities:

- Implement the annual inventory system in all States.
- Collect data on all lands including reserved and range lands.
- Collect a full suite of vegetation data and associated information.
- Follow standard protocols across all NFS lands.

-
- Allow for “à la carte protocols” with local and regional funding support.
 - Increase the intensity of the core grid as needed.

- Provide an inventory compilation and analysis package that meets NFS business needs.

NFS will participate in the process to help define the next FIA strategic plan.

Other FIA Program Features

Forest Products, Utilization, and Woodland Owner Studies

FIA is charged with monitoring and reporting on the status, condition, and trends of all the Nation's forests. Although plot-based field surveys provide most of this information, additional questionnaire and field-based surveys are conducted to report on TPO, fuelwood production, and characteristics and management objectives of the Nation's private woodland owners. The number of surveys is listed in appendix table C-8 and a brief overview of each survey type follows.

Primary mill surveys—FIA conducts TPO studies to estimate industrial and nonindustrial uses of roundwood in a State. To estimate industrial uses of roundwood, all primary wood-using mills in a State are canvassed. TPO questionnaires are designed to determine location, size, and types of mills in a State, and the volume of roundwood received by species and geographic origin as well as the volume, type, and disposition of wood residues generated during primary processing.

Logging utilization studies—Logging utilization studies provide the information to convert TPO volumes to inventory volume. Utilization factors developed from the data translate a standard unit of product (1,000 board feet of sawlogs, 1 cord of pulpwood, etc.) into a common volume unit and type of tree harvested. Estimates are made of how much product came from sawtimber growing stock, poletimber growing stock, and non-growing stock sources such as cull trees, dead trees, saplings, and limbwood. The overall process provides a cross-section of logging operations to characterize the sites logged, trees cut, products taken, and residues left behind. More detailed information on the forest products studies may be found in Smith (1991), Blyth and Smith (1979), and Morgan et al. (2005). Additional information and online data from all of these surveys is available at <http://fia.fs.fed.us>.

Fuelwood surveys—Studies of fuelwood production from roundwood are necessary to provide information to forest managers and users about the fuelwood harvest and its effect on the resource. How much fuelwood is harvested from forest land, urban areas, fence rows and windbreaks, or other sources is estimated from these studies.

National Woodland Owner Survey—The NWOS is the official survey of nearly 10 million forest owners in the United States. Its aim is to increase our understanding of woodland

owners who are the critical link between forests and society. The first national woodland owner survey was conducted by the Forest Service in 1978 and was subsequently followed by another national survey in 1994. Beginning in 2000, on an annual basis, the NWOS contacts forest landowners from across the county to ask them questions about the forest land they own, their reasons for owning it, how they use it, if and how they manage it, sources of information about their forests, their concerns and issues related to their forests, their intentions for the future of their forests, and their demographics. Summary information from the NWOS is used to provide, design, and implement services and policies that affect forest owners that include Government agencies, nongovernmental organizations, landowner organizations, private-service providers, forest industry companies, and academic researchers. A new cycle of data collection for the NWOS is scheduled to begin in 2011. The most recent woodland owner survey findings are available in Butler (2008).

Blyth, J.E.; Smith, W.B. 1979. Minnesota logging utilization factors, 1975–1976—development, use, implications. Res. Bull. NC-48. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 8 p.

Butler, B.J. 2008. Family forest owners of the United States, 2006. Gen. Tech. Rep. NRS-27. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 72 p.

Morgan, T.A.; Spoelma, T.P.; Keegan, C.E. et al. 2005. Montana logging utilization, 2002. Res. Pap. RMRS-52. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 12 p.

Smith, W.B. 1991. Assessing removals for North Central forest inventories. Res. Pap. NC-299. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 48 p.

Forest Health Indicator Surveys

FIA began implementing a nationwide, field-based forest health indicator monitoring effort in the 1990s, and it currently collects forest health measures in 47 States; most indicators are documented in terms of sampling protocols, data management structures, and estimation procedures. Field data from most sample years and indicators are available on line with numerous analytical examples published both internally and externally.

Field protocols associated with each indicator are available in the national field guide (USDA Forest Service 2006). Next, we present a brief description of the indicators and number of recent samples (appendix table C-9).

Crown condition—Tree crowns are an important component of net primary production, and trees with deteriorating foliage show visible signs of stress that often precede reduced growth and increased mortality. For this indicator, measurements are recorded on all sampled trees greater than 12.7 cm diameter at breast height, including uncompacted live crown ratio, crown diameter (for some years), crown density, foliage transparency, crown dieback, crown light exposure, and canopy position. The crown indicator is described in Schomaker et al. (2007).

Lichen communities—Long-term observation of epiphytic (i.e., tree-dwelling) lichen communities indicates changes in air quality, climate, and land use. For this indicator, field crews observe the presence of lichen species, estimate the abundance of each species, and collect specimens for identification by a specialist. Lichen community measurements are made within a 37-meter radius of each plot center (~ 0.38-ha area). The lichen indicator is described in Will-Wolf (2010).

Forest soils—Environmental stressors that interfere with soil function have the potential to influence the productivity, species composition, and hydrology of forest ecosystems. For this indicator, crews complete ocular estimates of the percentage and type of soil compaction or erosion, and they check for the presence of restrictive layers within the top 50 cm of soil. The crew then collects five soil samples—three forest floor samples to measure organic matter and carbon content, and a mineral soil core collected at two depths: 0–10 and 10–20 cm. Soil samples are sent to the laboratory immediately after collection and stored for future physical and chemical analysis. The soils indicator is described in O’Neill et al. (2005).

Vegetation diversity—The vegetation diversity and structure indicator is designed to evaluate the composition, abundance, and spatial arrangement of all vascular plants, for assessing wildlife habitat, site productivity, and the effects of invasive species. For this indicator, crews with previous botanical experience record both species and overall structural data for vascular plants including their total canopy cover and cover in different height zones (0 to 2 meters, 2 to 5 meters, and more than 5 meters). Specimens of species not readily identified in the field are collected for identification by a specialist. The vegetation indicator is described in Schulz et al. (2009).

Down woody material—The down woody material (DWM) indicator is designed to estimate detrital above-ground biomass in the form of coarse woody debris, fine woody debris, litter, and duff pertaining to important fire, wildlife, and carbon issues. For this indicator, coarse woody debris (greater than 7.5 cm in diameter) is sampled on a series of transects across the plot totaling 88 meters in length. Fine woody debris between 2.5 and 7.5 cm is sampled on a series of transects totaling 12 meters in length. Fine woody debris less than 2.5 cm is sampled on a series of transects totaling 7 meters in length. Duff and litter depth measurements are taken at 12 points located on the plot. The DWM indicator is described in Woodall and Monleon (2008).

Ozone injury—Ozone is a widely dispersed pollutant that reduces tree growth, changes species composition, and predisposes trees to insect attack and disease. Because ozone injury causes direct foliar injury to particular forest plant species, these species are used as “bio-indicators” to identify the presence and severity of local air pollution. Ozone injury is not observed directly on the FIA plot network because indicator species are not always present and openings in the canopy are necessary to obtain useful results. For this indicator, crews evaluate up to 30 individual bio-indicator plants for amount and severity of ozone damage. The ozone injury indicator is briefly described in Will-Wolf and Jovan (2008).

Other indicators—Other key indicators of forest health such as tree mortality and growth and the abundance of invasive and nonnative tree species are found in the basic plot data and subsequent remeasurements.

Bechtold, W.A.; Patterson, P.L., eds. 2005. The enhanced Forest Inventory and Analysis program—national sampling design and estimation procedures. Gen. Tech. Rep. SRS-80. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 85 p.

O’Neill, K.P.; Amacher, M.C.; Perry, C.H. 2005. Soils as an indicator of forest health: a guide to the collection, analysis, and interpretation of soil indicator data in the Forest Inventory and Analysis program. Gen. Tech. Rep. NC-258. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 53 p.

Schomaker, M.E.; Zarnoch, S.J.; Bechtold, W.A. et al. 2007. Crown condition classification: a guide to data collection and analysis. Gen. Tech. Rep. SRS-102. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 78 p.

Schulz, B.K.; Bechtold, W.A.; Zarnoch, S.J. 2009. Sampling and estimation procedures for the vegetation diversity and structure indicator. Gen. Tech. Rep. PNW-GTR-781. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 53 p.

U.S. Department of Agriculture Forest Service. 2006. Forest Inventory and Analysis National Core Field Guide (Phase 3), version 3.0. Washington, DC: U.S. Department of Agriculture, Forest Service, Forest Inventory and Analysis, Washington, DC: URL: <http://socrates.lv-hrc.nevada.edu/fia/dab/databandindex.html#4.%20%20Current%20National%20Core%20Field> (November).

Will-Wolf, S. 2010. Analyzing lichen indicator data in the Forest Inventory and Analysis program. Gen. Tech. Rep. PNW-GTR-818. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 62 p.

Will-Wolf, S.; Jovan, S. 2008. Lichens, ozone, and forest health—exploring cross-indicator analyses with FIA data. In: McWilliams, W.; Moisen, G.; Czaplowski, R. 2008 Forest Inventory and Analysis (FIA) symposium. October 21–23, 2008. Park City, UT. Proc. RMRS-P-56CD. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Woodall, C.W.; Monleon, V.J. 2008. Sampling protocols, estimation procedures, and analytical guidelines for down woody materials indicator of the Forest Inventory and Analysis program. Gen. Tech. Rep. 22. U.S. Department of Agriculture, Forest Service, Northern Research Station. 68 p.



Program Safety

Safety is a high priority for the Forest Service and especially for FIA, which travels hundreds of thousands of miles each year to conduct its business. Our vision for the national FIA program is to create an entire workforce culture that seeks to protect our employees, partners, and the public from daily exposure to hazards that threaten safety and health.

Standard safety training is mandatory and is conducted at each field unit. Safety training and equipment are provided for headquarters offices, field offices, and field crews, including driver training, first aid kits, and cell phones. In regions with special circumstances, such as the need for aircraft, access to large areas of wilderness, or exposure to potentially dangerous wildlife, additional training and equipment is provided. Information on specific safety training and criteria is available on line at <http://fia.fs.fed.us>. Figures 13 and 14 provide a summary of key safety trends.

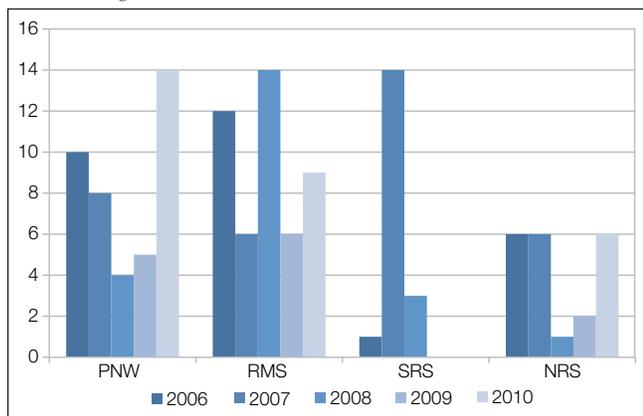
Regional Safety Notes

Pacific Northwest Research Station—The PNW continues its efforts to improve the safety and the safety awareness of its employees and partners. The PNW Resource Monitoring and Assessment (RMA) safety committee emphasizes safety

recognition with a Safe-T-Bucks reward system and Safety Employee of the Month recognition. To increase safety awareness, PNW publishes a monthly newsletter, the *Careful Chronicle*, which conducts an annual survey of employee safety perceptions and issues and collects near-miss and tailgate safety session reports. RMA explores ways to effectively summarize and use this information to improve processes and procedures and provide feedback to our personnel—in the office and in the field—on critical safety issues and trends. The 2010 safety action plan includes items such as (1) documenting safety-related training attended by PNW-FIA employees; (2) developing and modifying job hazard analyses (JHAs) for field-going personnel in urban, island, and interior Alaska projects; (3) developing effective mechanisms to share information on safety issues; (4) encouraging a proactive safety culture; (5) developing corporate solutions to FIA safety issues; and (6) working with the four regional program managers to develop a common safety vision.

Interior West (Rocky Mountain Research Station)—The IW-FIA program continued to focus on proactive risk management and employee involvement. A daily risk assessment tool was developed by Rocky Mountain Research Station to provide employees with a systematic approach to evaluate any current task. The main goal of the tool is to increase the safety dialog

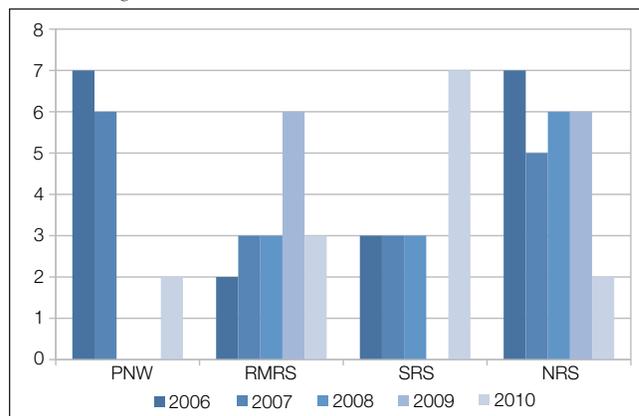
Figure 13.—Number of injury or illness incidents by FIA unit, 2006 through 2010.



FIA = Forest Inventory and Analysis. NRS = Northern Research Station. PNW = Pacific Northwest Research Station. RMRS = Rocky Mountain Research Station. SRS = Southern Research Station.

Notes: Work-related injury or illness resulting in any of the following: death, days away from work, restricted work or transfer to another job, medical treatment beyond first aid, or loss of consciousness. Value for SRS for 2009 and 2010 is zero.

Figure 14.—Number of motor vehicle accidents by FIA unit, 2006 through 2010.



FIA = Forest Inventory and Analysis. NRS = Northern Research Station. PNW = Pacific Northwest Research Station. RMRS = Rocky Mountain Research Station. SRS = Southern Research Station.

Notes: Any occurrence involving the use of a Government-owned or leased motor vehicle (automobile, truck, or bus) that results in a total combined damage exceeding \$500 or more. This definition also applies to privately owned vehicles when used on official government business. Value for PNW for 2008 is zero. Value for PNW and SRS for 2009 is zero.

of all the employees involved in a task while taking into consideration the current situational factors. During training, employees learned basic risk management principles, why and how to use the tool, and practiced using the tool. Because knee-related injuries are the unit's most frequent injury, employees also had a session with a professional athletic trainer and physical therapist focusing on knee injury prevention techniques in addition to standard safety training.

The IW-FIA Program committed to adding motorbikes as a mode of access for certain geographical areas after the safety committee, fleet manager, and safety specialist completed extensive research. Those employees designated as motorbike operators helped develop a JHA that determined the most effective personal protective equipment for the unit's needs. Those employees then completed a 2-day road safety training course and a 2-day dirt course. The unit had no reported motorbike incidents in its first year of use. Due to the success of the answering service based check-in pilot in 2009, it was implemented program-wide this year with much success. The program continued to develop and disseminate a bimonthly safety newsletter that provides timely safety and health information, messages from the program manager, quarterly incident summaries, and recognizes safety award recipients. Multiple awards were given throughout the year for proactive safety performance. Although the program incurred 10 recordable injuries, the unit had fewer restricted duty days than the previous year and one-half as many chargeable motor vehicle accidents.

Southern Research Station—SRS-FIA conducted two all-employee safety meetings, and the safety program manager presented a fire safety program to a local Boy Scout troop. Boating safety, first aid, CPR, and driving safety training were conducted for all field and office staff during FY 2010. The JHAs for the office and field staff were updated, as was the Continuation of Operations Plan and the Occupant Emergency Plan. Field staff clocked more than 64,000 hours in FY 2010 and office personnel logged 110,000 hours.

SRS-FIA had five vehicle accidents that resulted in damage to Government-owned vehicles (GOVs) but not to people or property. The program also had two hit-and-run accidents (third party) that resulted in damage to GOVs. In FY 2010, SRS-FIA logged more than 690,000 miles in GOVs, which is approximately 20,000 miles less than the program logged during FY 2009.

Northern Research Station—The NRS-FIA unit continues to emphasize safe work practices and encourage a culture that values the safety and well being of its employees.

The NRS-FIA unit provides nonmonetary awards for safety program activities and involvement. These include safety committee initiatives and awarding the winning author in our fourth annual safety story contest. This contest provides helpful safety tips to fellow employees and, more importantly, provides lessons learned from real life experiences.

The NRS-FIA Web site serves as a resource to all NRS-FIA employees on safety-related news, information, policy documents, and safety committee notes. NRS-FIA shares responsibility in presenting helpful safety information during monthly teleconferences and e-mails. Safety presentations shared with all staff through the Web site continue to be helpful.

The NRS-FIA St. Paul office conducted a safety walk-through to identify and address safety concerns, such as bookcases stacked higher than four shelves.

As part of a location safety audit, all NRS-FIA St. Paul staff received Government-issued driver licenses after completing on line defensive-driving courses. NRS-FIA employees continued to receive standard first aid and CPR training and field employees received additional wilderness responder training. JHAs for the field and office were reviewed, updated, authorized, and made available to all NRS-FIA staff through the unit's Web site.

An NRS-FIA unit initiated a check-in/check-out system for the field crew, providing each supervisor with the ability to keep track of crew members as they leave for and return from the field. For added safety measures, the NRS-FIA has initiated the SPOT™ satellite personal tracker. (*Note: The use of a trade name should not be considered an official endorsement of this product.*) SPOT is used to communicate with designated personnel when cell phone coverage is unavailable; it is primarily used for safety. Although most of the crews work in areas that have cell phone coverage, unfortunately not all areas have a reliable cell coverage network, which makes the SPOT system handy. In addition, SPOT is used to check in during the middle of the day to ensure that crew members are still operating safely in the field. SPOTs have several built-in safety features: for example, the HELP button allows the supervisor to respond to any nonmedical emergency by locating the crew member's position and sending aid directly to the location. Another feature is the ability to track the progress of a crew member; this feature is very useful in case the crew member becomes incapacitated. Finally, the most important feature used in the event of an emergency is the 911 message, which is sent directly to a center that contacts local search and rescue to immediately aid the endangered crew member.

The NRS-FIA Safety Committee was composed of five members from various locations across the region, including Minnesota, Pennsylvania, and New York. In addition, NRS-FIA staff members serve on the station's safety service board and on the headquarters and labs safety committees.

Although the unit incurred six recordable injuries this year, three were for treatment of poison ivy and/or embedded ticks. Only one injury resulted in light duty for 1 week.



Comparing FY 2009 Plans With FY 2010 Accomplishments and FY 2011 Plans

In the FY 2009 business report for FIA, we included a section stating our plans for FY 2010. Below we show how our actions in FY 2010 matched our plans from FY 2009 and our plans for FY 2011.

In the fiscal year 2009 business report, we said that in FY 2010 we would—	In FY 2010, we—	In FY 2011, we will—
Base Inventory and Reporting		
Continue base inventories in 46 States and coastal Alaska, and initiate base inventory in Hawaii, Nevada, and Wyoming.	Continued base inventories in 46 States and coastal Alaska and initiated base inventory in Hawaii, Nevada, and Wyoming. Developed prefield remote sensing strategies to reduce field checks and reduce costs.	Continue base inventories in 49 States and coastal Alaska if funding remains constant. Investigate cost-effective methods for interior Alaska. Finalize development of Field Manual 6.0 for implementation in FY 2012.
Publish results of the Nevada inventory pilot.	Published the results of the Nevada inventory pilot.	Continue to work with ARRA inventory project in New Mexico to provide statewide inventory data.
Work with American Recovery and Investment Act (ARRA) inventory project in New Mexico.	Worked with ARRA inventory project in New Mexico to provide statewide inventory data.	
Publish 5-year State reports for Vermont, New Hampshire, Massachusetts, Arkansas, Florida, Texas (eastern and western), Oklahoma (close-out periodic, eastern only), North Carolina, Arizona, and Colorado. Publish periodic reports for Commonwealth of the Northern Mariana Islands and Federated States of Micronesia. Continue movement to convert annual reports to simplified Web-based format.	Sent reports to edit or layout by October for Indiana, Arkansas, Arizona, Colorado, Washington, Federated States of Micronesia, and Commonwealth of the Northern Mariana Islands. Did not complete State reports for Vermont, New Hampshire, Massachusetts, Florida, Texas (eastern and western), Oklahoma (close-out periodic, eastern only), and North Carolina due to analysis delays.	Publish 5-year State reports for Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, Maine, Missouri, Florida, Texas (eastern and western), Oklahoma (close-out periodic, eastern only), North Carolina, Montana, coastal Alaska, Puerto Rico, and Marshall Islands.
National Woodland Owner and Timber Products Surveys		
Timber Products Output (TPO)—Develop a national, consistent vision for TPO, including a National Information Management System (NIMS)-compatible national data processing tool and online tools to query TPO data.	Formed national Forest Inventory and Analysis (FIA) team to draft a national strategic plan to modernize TPO. Developed a draft schematic of the NIMS version of national TPO database along with core tables and a beta version of online mill survey form.	Present national vision and strategic plan for TPO at 2011 national users group meeting and, upon approval, develop national TPO database. Publish first national pulpwood report.
National Woodland Owner Survey (NWOS)—Publish a 5-year summary report, develop an online data distribution tool, and begin planning for the next iteration of the survey. Continue planning for the next iteration of the NWOS. Work with partners to analyze the results from the NWOS. Develop techniques for creating geospatial NWOS products.	Published 5-year report, Butler, 2008, Family forest owners of the United States, 2006, GTR-NRS-27, and brochure, Butler and Carr, 2008, “Who owns America’s forests?” NRS-INF-06-08; completed pilot test for mapping in Michigan; and launched online data tool (http://fiatools.fs.fed.us/NWOS/tablemaker.jsp). Completed planning and approval of questionnaires by the Office of Management and Budget (OMB) for the next iteration of the NWOS. Worked with the University of Massachusetts, Utah State University, Auburn University, and other scientists within the Forest Service to further the analysis of the NWOS.	Continue planning for the next iteration of the NWOS. Conduct focus groups in five locations across the United States to test the survey instrument, gain additional insight into survey responses, and explore emerging topics for future surveys. Continue to work with partners to further the analysis of the NWOS. Deploy a more comprehensive test of the mapping techniques in selected States, select a final technique, and release a national map.

In the FY 2009 business report, we said that in FY 2010 we would—	In FY 2010, we—	In FY 2011, we will—
Pilot Studies		
Continue work with USDA Natural Resources Conservation Service (NRCS)-National Resources Inventory to deliver consistent indicators of rangeland sustainability to the National Forest System (NFS), Bureau of Land Management (BLM), State agencies, nongovernmental organizations (NGOs), and private landowners.	Completed final report on the Oregon multiagency rangeland pilot, which will be released and peer reviewed by an external panel.	Continue work with NRCS to deliver consistent indicators of rangeland sustainability to the NFS, BLM, State agencies, NGOs, and private landowners.
Continue urban forest monitoring in Colorado and Tennessee. Work with Alaska, California, Hawaii, Oregon, and Washington on ARRA urban study.	Completed data collection for 5th year for the urban forest inventory pilot in Colorado and conducted 1 year of urban remeasurement in Tennessee. ARRA project—Completed urban inventory pilot in Alaska and Washington.	Complete urban FIA report on the urban pilot work in Tennessee. ARRA project—Continue urban inventory work in California, Hawaii, and Oregon.
(New item in 2010.)	Conducted pilot testing for the National Land Cover Dataset (NLCD) Tree Canopy Cover (TCC) product. Transitioned to cover and land use as basis for extent of forest land. Developed and published models to estimate crown cover in west Texas.	Complete pilot testing for the NLCD TCC product. Launch activities in support of the monitoring trends in land change system. (NASA funding pending). Integrate Landtrender and FIA field plots in estimation of effect of land use, management, and disturbance on carbon flux.
Forest Carbon		
Research ways to use technology to increase program efficiency and to develop new products to meet customers' needs related to carbon estimation. (This was not listed in the 2009 Annual Report.) Develop the component ratio method (CRM) to deliver compatible volume and biomass data at the tree level in the Forest Inventory and Analysis Database (FIADB).	Published CRM papers. CRM delivers compatible volume and biomass data at the tree level in FIADB. Incorporated the Intergovernmental Panel on Climate Change (IPCC) forest carbon stock delineations into online tools (EVALIDator) that allow users to rapidly estimate IPCC-defined-forest carbon stocks. Mapped changes in forest biomass across the United States with Landsat and FIA data to approximate continental rates of biomass loss and accumulation from forest disturbance and regrowth. Developed critical loads for nitrogen deposition in Pacific Northwest forests.	Fully document all volume equations used by FIA nationally. Program the Forest Carbon Calculation Tool to use FIA-defined volume equations and CRM biomass apportionment, which will provide more consistency between official National Greenhouse Gas Inventory and estimates derived from FIA tools. Submit manuscript on 30 years of land use change in Washington. Complete the research study plan and initiate the CRM3 research funding process for all FIA volume and biomass calculation.
Experimental Forests and Ranges		
(The 2010 Budget included money to implement activity related to FIA on Experimental Forests and Ranges [EFRs].)	Initiated planning and FIA activity on 21 Forest Service EFRs across the country. Initiated an experimental forest research initiative to explore dead wood carbon, soil carbon, and other key associations. Note: See text for brief description.	Continue with the implementation of the FIA and EFR project (funding dependent).

In the FY 2009 business report, we said that in FY 2010 we would—	In FY 2010, we—	In FY 2011, we will—
Information Management and Distribution—FIDO		
<p>Improve Forest Inventory Data Online (FIDO's) user interface to make the application easier to use.</p> <p>Complete migration of FIDO to the Forest Service consolidated data center.</p> <p>Develop FIDO interfaces for other FIA data sets. Enhance the mapping capabilities of FIDO.</p> <p>Continue to make our data more accessible and usable by adding analytical tools and program documentation on line.</p>	<p>Released the production version of FIDO that significantly extended the functionality of the earlier version allowing users to create custom reports and use the estimation engine to produce population estimates and variances per the published methods. Sent FIADB 4.0 documentation to publisher.</p> <p>In October 2009, began FIDO interface development for NWOS and TPO data sets and testing of FIDO and DataMart transfer to the data center.</p> <p>Served more than 69,000 data requests and participated in supporting the Forest Service booth for Society of American Foresters and Ecological Society of America national conferences.</p>	<p>Continue to improve FIDO's user interface.</p> <p>Release printed FIADB 4.0 documentation and Web release FIADB 5.0 documentation.</p> <p>Conduct training Webinars, including some held at Purdue University in conjunction with the Forest Service.</p> <p>Complete migration to data center by September 30, 2011.</p>
Information Management and Distribution—MIDAS		
<p>Continue implementing MIDAS portable data-entry software in all regions.</p> <p>Begin work on the next version of MIDAS to incorporate suggested feature enhancements and new technologies.</p> <p>Complete the beta release of the Portable Data Recorder data collection program (MIDAS) with national and regional variables.</p>	<p>Completed development of MIDAS 5.0 in support of the National Field Guide. Fully integrated all the regions and States into MIDAS (Hawaii is in beta testing).</p> <p>Added all of the Phase 3 indicators to the MIDAS system—DWM, lichens, ozone, soils, and vegetation.</p> <p>(On average, about 700–800 active users are in MIDAS and we are collecting roughly 1,000–1,500 plots across the Nation each week.)</p>	<p>Begin work on the next version of MIDAS to incorporate suggested feature enhancements and new technologies and prepare for version 6.0 of the National Field Guide. (Implement changes by October 1, 2011.)</p> <p>Improve security protocols to prepare for a public proxy server to MIDAS behind the firewall for contract users without access to the Forest Service network.</p> <p>Initiate the Chief Information Office process to get the FIA suite of applications (MIDAS, MIDAS-NIMAC, Core Reports, Field Data Manager, NIMAC Field Data Manager) ported to new a server environment.</p>
Information Management and Distribution—NIMAC		
<p>National Inventory and Monitoring Applications Center (NIMAC)—Provide technical assistance and software tools to States, NFS, and collaborating nations to monitor criteria and indicators of sustainable forestry on their lands using consistent and compatible methods.</p> <p>Continue to work with Indiana and Wisconsin on data collection and processing of State lands inventory data.</p> <p>Design and conduct year 2 data collection for the Plains States Nonforest Tree Inventory.</p> <p>Begin development of Web-based analytical tool for NFS. Continue with plot intensification planning on NFS lands.</p> <p>Collect and process data from Honduras rainforest plots.</p>	<p>Completed another panel of data collection and processing in Wisconsin. Completed the study and reported on the results. Made first year data for Wisconsin State forests available via the Web using FIDO. Provided technical assistance and software tools to Indiana and Wisconsin (State forests) and four Plains States (trees outside forests).</p> <p>Developed and plot-tested a land cover change photo-interpretation method in Maryland.</p> <p>(Missouri funded NIMAC to design intensification on State forests.)</p> <p>Identified requirements for the Design and Analysis Tools for Inventory and Monitoring and received funding from NFS for software development. Gave technical assistance to four national forests. (Based on use of the design tool, all forests in Region 9 will be intensified.)</p> <p>Completed the monitoring system for forests in Honduras.</p>	<p>Complete the fifth panel of data collection in Wisconsin (start remeasurement in FY 2012), the fourth panel in Indiana, and first panel in Missouri.</p> <p>Publish the Plains States inventory methodology.</p> <p>Begin development of Web-based, preproduction analytical tool for NFS. Continue with plot intensification planning on NFS lands. Implement intensification in Region 9.</p> <p>Develop and implement bilingual data collection software. Collect and process data from Honduras rainforest plots.</p>

In the FY 2009 business report, we said that in FY 2010 we would—	In FY 2010, we—	In FY 2011, we will—
Information Management and Distribution—NIMS-CS		
<p>Release National Information Management System (NIMS-CS) 4.0 production version along with NIMS-CS 4.0a with enhanced functionality and support for FIADB 4.0. Migrate FIADB and NIMS-CS to the Forest Service data center.</p> <p>Continue to improve NIMS to enhance program data delivery.</p>	<p>Released NIMS-CS 5.0 test version, which supported processing Field Guide 5.0 data. This version includes features to support migration to the data center.</p> <p>Released NIMS-CS 4.0 production version and support for FIADB 4.0. Continued transferring FIADB and NIMS-CS to the data center.</p> <p>Updated NIMS-CS 4.0 and used it to process 2008, 2009, 2010 data, and modified it to manage 5.0 2011 data. Test FIADB transferred to data center.</p>	<p>Finalize NIMS-CS 6.0 production version for release in FY 2012. NIMS-CS 6.0a with enhanced functionality and support for FIADB 6.0.</p> <p>Transfer NIMS-CS to the data center.</p> <p>Transfer NIMS-CS 5.0 to the data center and process 2011 data at the data center. Modify NIMS-CS for 6.0 2012 variable collection and processing.</p> <p>Finish transferring all of the FIA databases, processing systems, and online tools to the National Information Technology Center.</p>
FIA Atlas Project		
<p>Continue working on FIA Atlas. Develop layout format and preliminary storyboards with final map selections. Target rollout date is late 2010, in time for 2011, which is the “International Year of the Forest.”</p> <p>Complete the first design phase of a national FIA Atlas consisting of more than 75 Web-based maps illustrating multiple aspects of nationwide forest issues using FIA and related data.</p>	<p>Moved rollout date to late 2011.</p> <p>Established a team built upon FIA’s technical expertise by including editorial and production staff from Publishing Arts, the Remote Sensing Applications Center, and the Geospatial Service and Technology Center in Salt Lake City.</p> <p>Collaborated on finalizing the outline, storylines, and potential maps and supporting content. Developed a poster for the FIA Symposium that served as a test bed for atlas production processes.</p> <p>Developed prototype maps for the FIA Atlas for review and placed on the national FIA Web site.</p>	<p>Complete final maps and storyboards and prepare features for each chapter with a goal to lay out and print the atlas in 2011.</p>
Collaboration and Partnerships		
<p>Continue collaborative stewardship of the FIA program by holding user-group meetings in all regions of the country and at the national level, and holding regional management team meetings in all regions of the country. Begin planning for the 2010 FIA Science Symposium and resume scientific symposium on a biennial basis.</p>	<p>Held a total of 10 user group and management team meetings in all regions of the country.</p> <p>Began planning for next FIA strategic plan for 2013–2017.</p> <p>Held the FIA science symposium in Knoxville, TN, in October 2010, with more than 200 attendees from dozens of organizations.</p> <p>Continued to use WebEx and Video Teleconference to reduce travel costs.</p>	<p>Continue collaborative stewardship of the FIA program by holding user-group meetings in all regions of the country and at the national level, and holding regional management team meetings in all regions of the country.</p> <p>Make increased use of electronic communications and training Webinars in an effort to balance travel costs while meeting client needs.</p> <p>Begin planning for FIA’s next strategic plan with regional user input and four strategy sessions around the country in 2011 and early 2012.</p> <p>Begin planning for the 2012 FIA Science Symposium.</p>

Adjunct Projects

Experimental Forests and Ranges

In FY 2010, Congress included \$2 million in the FIA appropriation to be used to initiate intensive site monitoring for Forest Service Experimental Forests and Ranges (EFRs). Five selection criteria were identified to guide site selection: (1) sites with long-term data, (2) sites where an intensified plot grid could provide data for an early warning system, (3) sites in areas expected to be highly sensitive to climate changes, (4) sites that connect widespread gradients of conditions, and (5) practical or administrative considerations in the current fiscal year that make site selection effective. We used these criteria to rapidly screen 81 total EFRs and select 16 sites. More thorough screening of other sites may take place in the future. The initial sites selected for investment in FY 2010 were—

- Bonanza Creek Experimental Forest, AK.
- Fort Valley Experimental Forest, AZ.
- Alum Creek and Crossett Experimental Forests, AR.
- Fraser Experimental Forest, CO.
- Hawaii Experimental Tropical Forest, HI.
- Priest River Experimental Forest, ID.
- Baltimore Ecosystem Study, MD.
- Marcell Experimental Forest, MN.
- Tallahatchie and Harrison Experimental Forests, MS.
- Tenderfoot Creek Experimental Forest, MT.
- Bartlett and Hubbard Brook Experimental Forests, NH.
- Pine Barrens Experimental Forest, NJ.
- Coweeta Hydrological Lab, NC, and Santee Experimental Forest, SC.
- Luquillo Experimental Forest and San Juan ULTRA, Puerto Rico.
- Great Basin Experimental Range, UT.
- Estate Thomas Experimental Forest, U.S. Virgin Islands.

Funding in FY 2010 supported plot intensification on 10 experimental forests (Bonanza Creek, Calhoun, Coweeta, Estate Thomas, Great Basin, Hawaii Tropica, Luquillo, Priest River, and Santee Experimental Forests and Glacier Lakes Ecosystem Experimental Site) as well as ecological representation assessments of existing EFRs and historic data archiving across the EFR system. Additional research was associated

with linkages to the national Carbon Eddy Flux Tower Network sites at Bartlett, Hubbard Brook, Marcell, and New Jersey Pine Barrens Experimental Forests and the Baltimore Long-Term Ecological Research site.

In FY 2011, funding would again be distributed across all research stations for investment in plot intensification, to continue ongoing research on ecological representativeness toward the goal of identifying underrepresented ecosystems in the EFR portfolio, and to expand the use of metadata to make better decisions about imputing FIA plot data and dedicated research study plot data. Detailed recommendations on investments for FY 2011 will be guided by a strategic planning committee composed of FIA program managers and EFR scientists representing each Station. Current indications are that funding for this work will not be available in FY 2011.

American Recovery and Reinvestment Act

In 2010, two projects were funded under the President's American Recovery and Reinvestment Act that will have a direct effect on the FIA program. A brief summary of these projects follows.

ARRA Project: Forests adapting to and mitigating climate change effects: an inventory of forest conditions in urbanized areas of the Pacific Coast States.

The PNW partnered with the Oregon Department of Forestry and California Polytechnic State University to conduct an FIA inventory of the urban areas in Alaska, Washington, Oregon, California, and Hawaii. Although PNW-FIA is providing overall technical assistance, the funding for data collection is through a grant under ARRA. Both partners hired private contractors to accomplish the fieldwork. The sample plots are on grid and within a boundary designated by the 2000 Census as an Urbanized Area; most are classified as nonforest. The sampling protocols follow the same guidelines developed for urban inventories by the national FIA program and are compatible with the urban pilot inventories recently completed in Colorado and Tennessee. The data will provide information about existing condition and extent of the urban forest. It is anticipated that over time the data collected from these plots will provide valuable information about potential changes in the

health of urban ecosystems. All data collection is projected to be completed by the end of the 2012 field season; compilation and analysis will follow.

ARRA Project: Inventory of New Mexico's forest resources.

The New Mexico State Forester's office and members of the IW-FIA data-collection team have successfully implemented a project under the President's ARRA in New Mexico that will result in the collection of approximately 70 percent of the State's annual forest inventory plots during the 2011 and 2012 field seasons. In this collaborative effort, the State forester and his or her staff, with support from the Rocky Mountain Research Station and NFS Region 3, developed a proposal to create new jobs within New Mexico through field inventory

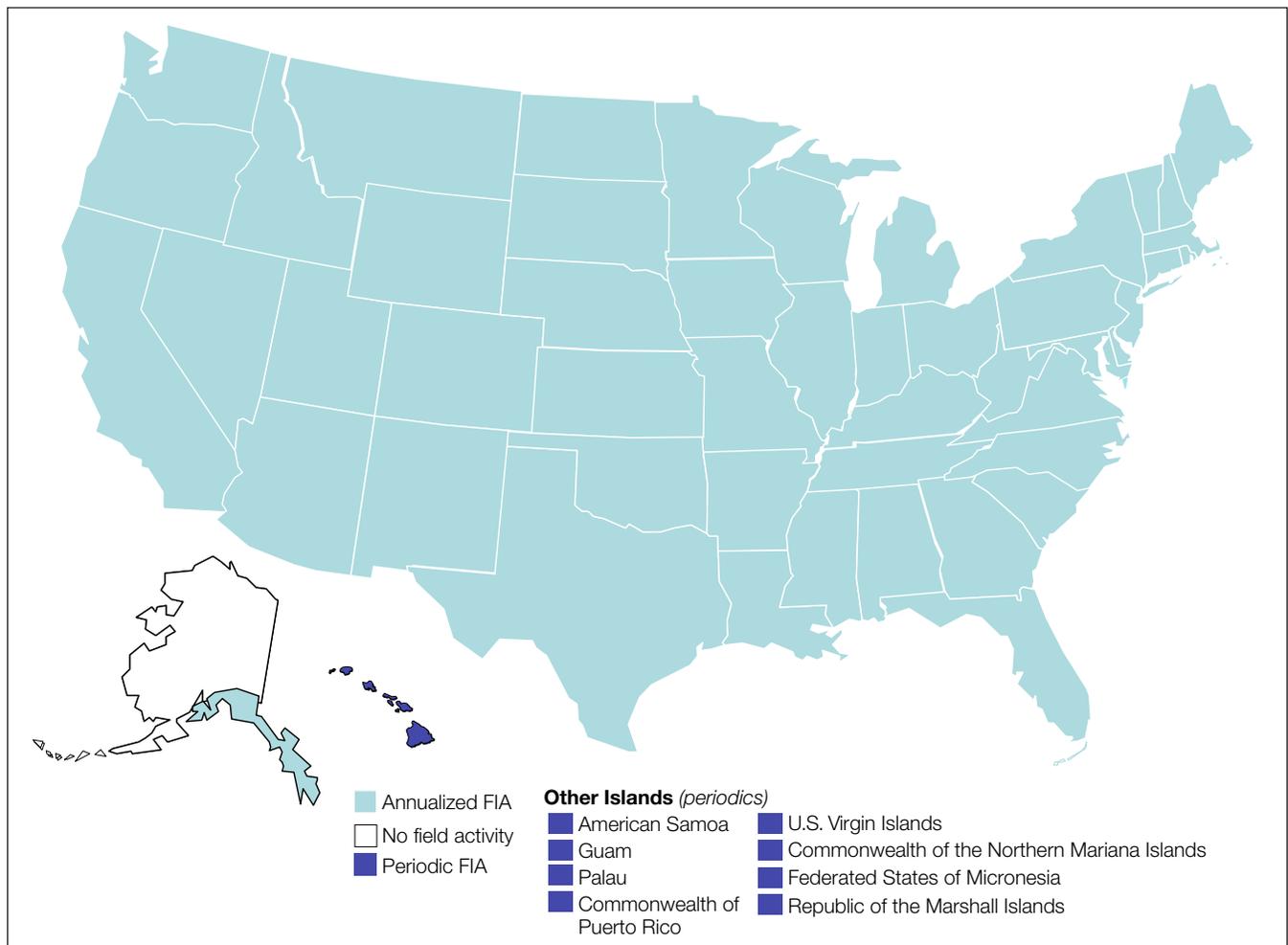
work, hiring several private contractors and local tribes to collect FIA data. Coordinating with the FIA field data-collection staff for training and QA, this effort will significantly accelerate the update of information in the State. Inventory data for New Mexico forests are needed because significant resource events such as drought, fire, and insect mortality have changed the State's forests dramatically since the last statewide periodic inventory was completed in 2000. In 2010, a plan was developed as part of the ARRA project to visit 4,411 plots (6 panels) in 2011 and 747 plots (1 panel) in 2012. Compilation and analysis will follow fieldwork. The New Mexico State forester, New Mexico State timber management officer, and participating IW-FIA staff were recognized with the Quantitative Sciences Director's Award for FIA Excellence for their leadership in this effort.

Fiscal Year 2011 FIA Program Direction

The FY 2011 budget has considerable uncertainties because we began the year under a temporary continuing resolution. If FY 2011 funding remains at the FY 2010 level, the FIA program will continue inventory operations in 49 States and coastal Alaska (fig. 15). Other major activity planned for 2011 includes transferring FIA data operations to the National Information Technology Center, getting back on track with

State 5-year reports, beginning the next iteration of the NWOS, modernizing the program’s TPO operations, improving land-cover and land-use classification, completing the FIA Atlas project, developing the program’s 2013–2017 strategic plan, and continuing to fund \$2 million for research at experimental forests and ranges related to FIA long-term monitoring needs.

Figure 15.—Planned FIA implementation status, FY 2011.



FIA = Forest Inventory and Analysis. FY = fiscal year.



Long-Term Strategic Direction

The FIA program initially intended to implement the “Strategic Plan for Forest Inventory and Monitoring” by achieving a base Federal program of 10 percent per year in the West and 15 percent per year in the East by FY 2003. Unfortunately, although funding for the FIA program increased over the past several years, it was not increased sufficiently to allow full program implementation as scheduled by 2003. We continue to be optimistic that funding will remain steady or increase in 2012 and beyond to allow full implementation of the program. Aggressive partner financial support has allowed FIA to achieve full implementation and 5-year cycles throughout most States from the Great Plains eastward.

The Government Performance and Results Act (GPRA) of 1993 directs Federal entities to develop long-term goals and performance measures to monitor progress toward those goals. Although intended for application at the agency level, the GPRA framework also provides an excellent tool for guiding progress at the project level. The following table shows our key goals, performance measures, benchmarks, and targets for the FIA program for 2004 through 2010. In future business reports, we will repeat this table to show how we are progressing toward our goals.

Goal	Performance measure	2005 level	2006 level	2007 level	2008 level	2009 level	2010 level	Target level
Inputs								
Maintain sufficient funding to support the base Federal FIA program ¹	Percentage of total Federal funding necessary for annualized inventory received	80	84	84	85	87	90	100
Outputs								
Include 100 percent of U.S. forest lands in the FIA sample population	Percentage of Nation's forest land included in the target FIA sample population	100	100	100	100	100	100	100
Keep fieldwork current	Percentage of States actively engaged in the annualized inventory program	88	88	90	94	94	98	100
Make data accessible to national forest customers	Percentage of national forest land for which FIA data are loaded into the Natural Resource Information System	80	84	90	92	92	100	100
Outcomes								
Keep analysis current	Percentage of States with FIA State report less than 6 years old	48	42	42	60	76	74	100
Keep online data current	Percentage of States with FIA online data less than 2 years old	80	84	88	90	90	84	100
Customer satisfaction	Percentage of customers rating service as “satisfactory” or better	85	85	85	85	85	87	100
Partner participation	Partner financial contributions expressed as percentage of total program funds	11	10	10	11	9	10	20

¹ Revised percents based on new congressional target of \$77,761,000.



Conclusions

We continue to operate in a new arena of partnership and collaboration in which Federal and State agencies and other colleagues work together to plan, manage, implement, and continuously improve the FIA program. We are gathering and disseminating information on a wider array of ecological attributes while continuing to serve our traditional customers who require timely information on forest resources. We are increasing the timeliness of our surveys and of our reporting to provide a continuously updated, publicly accessible information base that includes meaningful reports, analyses, and elemental data for others to use. We are exploring and using

the latest technology to expand the scope of our products and to deliver them more efficiently. We are also openly reporting on our progress, our accomplishments, our successes, and our challenges.

In summary, we are committed to working collaboratively with our partners to deliver the best program possible with the resources that we have at our discretion. We hope this report gives you a transparent view of the business practices of the FIA program, and we encourage you to help us improve the program with your feedback.



Glossary of Terms Used in Appendixes

base Federal FIA program. A level of FIA program delivery that includes sampling 10 percent of base grid P2 plots per year in the Western United States, 15 percent of base grid plots per year in the Eastern United States, and 20 percent of P3 plots nationwide, with data compiled and made available annually and complete State analyses done every 5 years.

base grid plots sampled. The base grid consists of one sample location per approximately 6,000 acres (P2) and one location per approximately 96,000 acres (P3). Some partners chose to intensify beyond the base grid.

buy down. Plots installed at State expense to reach 20 percent implementation level.

core reports. A class of publications that summarizes forest status and trends for a complete administrative unit, such as a whole State or a national forest. Examples include survey unit reports, State statistical or analytical reports, or national forest reports.

direct expenses. All expenses directly attributable to the FIA unit incurred as a part of doing FIA business. Excludes indirect business costs (such as rent, telephones, and administrative overhead outside the FIA unit staff), which are included below in “effective indirect expenses.” Includes work done for other units as a normal part of FIA business and the following items:

equipment. Costs for durable goods used for FIA. Includes the following—

computer/telecommunications. Computer hardware, software, communications costs.

field equipment. Measurement tools and equipment, such as data recorders, carried by field crews.

imagery. Aerial photos, satellite imagery data files.

other. Any cost that does not fit into one of the other equipment categories.

vehicles. All vehicle costs, including items such as operating costs, depreciation, and leases.

grants and agreements. Cost of cooperative grants and agreements that directly support the FIA mission.

office space and utilities. Charges for rent, lease, or other real estate costs for FIA staff, plus utilities.

other direct expenses. Any cost that does not fit into one of the other categories, including training costs, unemployment, office supplies, postage, awards, moving expenses, and other expenses related to delivering the FIA program.

publications. Costs for editing, laying out, printing, and distributing publications.

salary. Includes direct salary and costs, plus benefits charged to the FIA unit, broken into the following categories:

administration. Program manager, project leader, and clerical staff.

analysts. Staff who analyze data and write publications.

Phase 1 production. Aerial photo-interpreters, satellite image analysts engaged in Phase 1 stratification.

data collection. All staff spending at least 50 percent of their time measuring regular plots.

field support. Field crew supervisors who spend less than 50 percent of their time measuring plots; others involved in supporting and coordinating field crews.

information management. Programmers, data compilers, computer system support staff.

QA (quality assurance) crews. All staff spending at least 50 percent of their time doing QA fieldwork.

techniques research. Mainly research staffs who conduct FIA-related research on methods and techniques.

travel. Broken into the following categories:

field/QA travel. Travel costs for field crews and QA crews.

office travel. Travel costs for all staff except field crews and QA crews.

effective indirect expenses. Indirect expenses include items such as research station management and administrative salaries, operating expenses, research station budget shortfalls, and other items for which the FIA unit is assessed by their research station. Each station has its own means for determining these assessments. Rather than reporting the different rates, we simply calculate the “Effective Indirect Expenses” item by subtraction: Effective indirect expenses = (total available funds) – (total direct FIA expenses + end of year balance).

effective indirect rate. Effective indirect expenses divided by total available funds. This is not necessarily the same as the standard station overhead rate; instead this rate reflects the total indirect cost as a fraction of the total funds available to FIA.

FRIA (Forest Resource Inventory and Assessment).

An account created by Congress within the S&PF portion of the Forest Service budget to provide funds to support FIA collaboration with States.

FY (end-of-the-year) balance. Funds reported in the previous fiscal year business report as unspent at the end of that fiscal year and presumably available for use in the current fiscal year.

intensification. Plots installed at State, National Forest System, or other partner expense to achieve higher quality estimates for smaller areas.

management meetings held. Number of national or regional management team meetings held by each FIA unit. A management team for each FIA region consists of partners who are sharing in the funding and implementation of the FIA program. The team typically consists of representatives from the FIA unit, NFS regional offices, S&PF offices, and State forestry agencies.

NGO (nongovernmental organization). A class of customers with whom FIA staff are asked to consult. Includes environmental organizations, professional societies, and other generally nonprofit organizations.

NIPF (nonindustrial private forest land owners). Private individuals or organizations who own forest land for purposes other than industrial operations.

percentage of full funding. Total available funds divided by the funding needed to fully implement the base Federal program for a given year’s target funding.

percentage of region covered by annual FIA. Sum of forested acres in States currently implementing annual FIA, divided by the total number of forested acres in each FIA region; a measure of the degree to which the FIA region has moved from periodic to annual inventory.

percentage of total plots sampled. Total number of base grid plots sampled divided by the total number of plots in the base grid.

Phase 1. Stratification of the land base into forested and non-forested classes by using remotely sensed imagery (aerial photographs or satellite imagery). Done to increase the efficiency of fieldwork and estimation.

Phase 2. A set of sample locations, approximately one for every 6,000 acres of land, measured for basic mensurational forest attributes.

Phase 3. A subset of P2 sample locations, approximately one for every 96,000 acres of land, measured for a more extended set of ecosystem attributes, including tree crown condition, lichen community diversity, soil data, and down woody debris.

publications. Number of publications per unit, by type of publication, as reported in official agency attainment reports. Publications are among the major outputs of the FIA program. Types of publications include the following:

core reports. A report pertaining to reporting inventory results for a complete geographic entity. Includes:

national forest reports. A complete analysis for a single national forest.

national report. A report for the entire Nation, such as the Resource Planning Act report.

regional reports. A report for a group of States or other contiguous unit larger than a single State, such as a regional assessment.

State resource reports. A complete statistical or analytical summary of the forested resources within a single State.

State timber product output (TPO) reports. A complete analysis of TPO data for a single State.

other. Publications that do not fit into any of the other categories, such as abstracts, books, or other Government publications.

other station publications. A manuscript published by the Forest Service, for example, a general technical report.

peer-reviewed journal articles. An article appearing in a refereed or peer-reviewed journal.

proceedings papers. An article appearing in the proceedings from a meeting or symposium.

significant consultations. Cases in which an FIA staff person spent at least 1 hour in discussion, analysis, or research to address a specific question or need raised by an external FIA program customer, and which is not part of our normal course of business in collecting, analyzing, and reporting FIA information.

total available funds. Total funds available for delivering the FIA program, including funds appropriated by Congress for the FIA program, other funds made available by Forest Service partners, and previous year carryover funds. This is a measure of Federal funding for the base Federal program.

user-group meetings held. Number of user-group meetings sponsored or attended by each FIA unit. A user-group meeting is an open meeting in which a complete regional cross section of FIA partners and customers are invited to attend. User-group meetings differ from the usual smaller meetings with one or two partners that all FIA units call as a normal course of business.



Appendix A. Contacts

For information about the status and trends of America's forests, please contact the appropriate office below.

Northern Research Station FIA

Program Manager, FIA
 USDA Forest Service
 North Central Research Station
 1992 Folwell Avenue
 St. Paul, MN 55108
 651-649-5139

Southern Research Station FIA

(includes Commonwealth of Puerto Rico and the U.S. Virgin Islands)

Program Manager, FIA
 USDA Forest Service
 Southern Research Station
 4700 Old Kingston Pike
 Knoxville, TN 37919
 865-862-2073
 503-808-2026

National Office

National Program Leader, FIA
 USDA Forest Service
 1601 North Kent Street, Suite 400
 Arlington, VA 22209
 703-605-4177

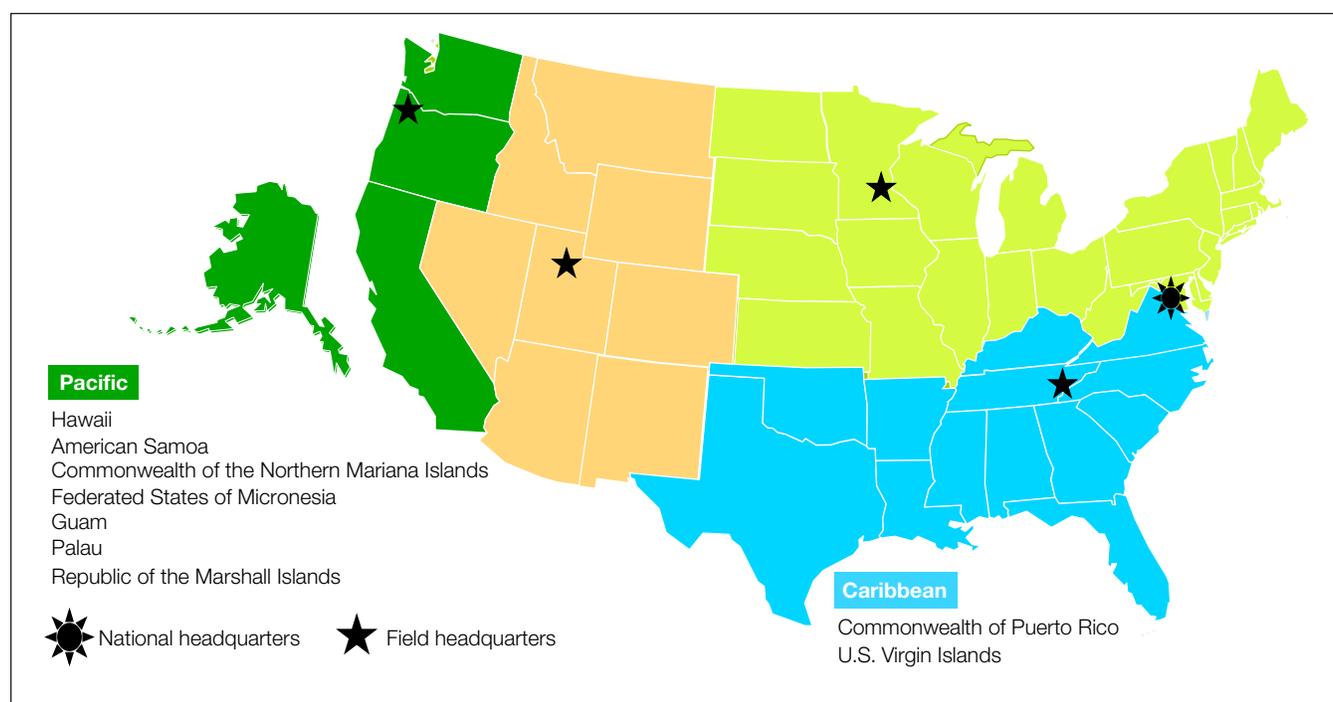
Interior West FIA

Program Manager, FIA
 USDA Forest Service
 Rocky Mountain Research Station
 507 25th Street
 Ogden, UT 84401
 801-625-5388

Pacific Northwest Research Station FIA

Program Manager, RMA (FIA)
 USDA Forest Service
 Pacific Northwest Research Station
 620 SW Main St., Suite 400
 Portland, OR 97205

All our regional Internet home pages, as well as a wealth of statistical and other information, are available through the national FIA home page located at <http://www.fia.fs.fed.us>.



FIA = Forest Inventory and Analysis.



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Table B-1.—Performance measures for the FY 2010 FIA program. (1 of 2)

	Pacific Northwest	Interior West	Southern	Northern	National Office	Total
Total available Federal funds, FY 2010 (\$)	15,665,000	14,774,000	16,094,782	17,636,794	8,576,000	72,746,576
Total appropriated Federal funds, FY 2010 (\$)	14,965,000	14,768,000	16,284,000	17,224,000	8,576,000	71,817,000
Estimated % of FY 2010 full funding ^a	94/81	94	95	93	81	92
Contributions from partners						
Supporting the 20% FIA program (\$)	182,500	0	1,987,251	1,104,297	0	3,274,048
Value-added contributions (\$)	184,406	805,962	161,040	3,090,779	0	4,242,187
Total contributions (\$)	366,906	805,962	2,148,291	4,195,076	0	7,516,235
Total all available funds, FY 2010 (\$)	16,031,906	15,579,962	18,243,073	21,831,870	8,576,000	80,262,811
Base grid plots sampled (includes buy down)						
Phase 2, forested	1,565	2,271	8,107	6,123	—	18,066
Phase 2, nonforested	1,839	3,628	2,984	15,227	—	23,678
Total Phase 2 plots	3,404	5,899	11,091	21,350	—	41,744
Phase 3, forested	100	175	512	419	—	1,206
Phase 3, nonforested	115	232	194	1,019	—	1,560
Total Phase 3 plots	215	407	706	1,438	—	2,766
Total base grid plots	3,619	6,306	11,797	22,788	—	44,510
Intensification plots sampled						
Phase 2/3, forested	813	377	118	1,666	—	2,974
Phase 2/3, nonforested	41	34	1	2,219	—	2,295
Total intensification plots	854	411	119	3,885	—	5,269
Number of QA plots						
Phase 2 (forest + nonforest)	217	322	1,737	1,515	—	3,791
Phase 3 (forest + nonforest)	—	30	143	56	—	229
Total QA plots	217	352	1,880	1,571	—	4,020
Total base grid plots and percent sampled^b						
Total Phase 2 and 3 target base grid plots	41,463	91,341	89,205	101,342	—	323,351
Phase 2 and 3 target (with buy down) (%)	9	7	13	22	—	14
Percentage of States with annual FIA activity ^c (%)	100	100	100	100	—	100
Number of publications						
National forest reports	—	2	—	1	—	3
State resource reports	3	—	2	17	—	22
State TPO reports	—	—	2	4	—	6
Regional reports	2	1	2	—	—	5
National reports	1	1	7	—	2	11
Subtotal—core reports	6	4	13	22	2	47
Peer-reviewed journal articles	13	10	10	41	—	74
Proceedings articles	2	4	12	12	—	30
Other station publications	—	3	10	19	—	32
Other publications	—	—	2	17	1	20
Total, all reports	21	21	47	111	3	203
Number of publications per Federal FTE	0.21	0.21	0.56	1.09	0.86	0.52
Consulting activities						
Number of significant consultations	109	404	179	270	29	991
Total hours of significant consultations	1,193	1,638	940	6,463	147	10,381

Table B-1.—Performance measures for the FY 2010 FIA program. (2 of 2)

	Pacific Northwest	Interior West	Southern	Northern	National Office	Total
Meetings						
User-group meetings held	1	2	0	1	1	5
Management meetings held	1	0	2	1	1	5

FIA = Forest Inventory and Analysis. FTE = Full-time equivalent. FY = fiscal year. QA = quality assurance. TPO = Timber Products Output.

^a Values for Pacific Northwest indicate percent of target without and with interior Alaska included. Total excludes interior Alaska.

^b Base grid targets shown are 20 percent of samples per year as stated in the Farm Bill. Congressional conference notes recommended annual Federal targets of 15 percent in the East and 10 percent in the West. Interior Alaska as well as the Caribbean and Pacific Island inventories are periodic and excluded from this mandate in compliance with congressional recommendations.

^c Revised measure based on number of States where annualized inventory is active (see last section of appendix table C-11 for previous measures). Includes only coastal Alaska.

Table B-2.— *Financial statement for the FY 2010 FIA program Federal funds.*

	Pacific Northwest (\$)	Interior West (\$)	Southern (\$)	Northern (\$)	National Office (\$)	Total (\$)
Available funds						
Previous year EOY balance	785,987	69,159	153,215	80,468	0	1,088,829
Post-year adjustments ^a	(85,987)	(63,159)	(342,433)	332,326	0	(159,253)
Subtotal pre-year adjustments	700,000	6,000	(189,218)	412,794	0	929,576
FY appropriated funds						
Research (base) ^b	14,215,000	13,086,000	15,840,000	16,608,000	7,190,000	66,939,000
State and private FRIA (base)	750,000	1,682,000	444,000	616,000	1,386,000	4,878,000
Subtotal appropriated funds	14,965,000	14,768,000	16,284,000	17,224,000	8,576,000	71,817,000
Special project funding	0	0	0	0	0	0
Total available Federal funds	15,665,000	14,774,000	16,094,782	17,636,794	8,576,000	72,746,576
Direct expenses						
Salary—	8,387,691	7,965,711	6,843,175	9,132,050	365,000	32,693,627
Administration	434,147	737,985	461,605	421,046	365,000	2,419,783
Phase 1 production	0	0	382,346	479,534	0	861,880
Field support	1,142,758	982,434	646,043	822,663	0	3,593,898
Data collection	3,190,146	3,223,838	535,743	2,413,342	0	9,363,069
QA	385,936	566,696	1,098,620	556,147	0	2,607,399
Information management	1,467,009	1,071,722	1,140,152	1,707,520	0	5,386,403
Analysis	1,059,422	660,445	1,803,416	1,833,284	0	5,356,567
Techniques research	708,273	722,591	775,250	898,514	0	3,104,628
Travel—	1,926,256	1,053,883	866,967	815,742	24,600	4,687,448
Office travel	98,644	119,943	369,164	230,052	24,600	842,403
Field/QA crew travel	1,827,612	933,940	497,803	585,690	0	3,845,045
Equipment—	502,834	779,588	331,868	759,607	0	2,373,897
Imagery	8,364	32,857	0	12,505	0	53,726
Vehicles	223,483	418,619	277,732	402,459	0	1,322,293
Field equipment	170,836	148,643	41,626	186,296	0	547,401
Information technology/communications	100,151	78,692	0	83,540	0	262,383
Other	0	100,777	12,510	74,807	0	188,094
Publications	16,099	9,735	0	1,955	4,500	32,289
Grants and agreements ^c	755,970	1,684,412	6,048,906	4,150,594	1,275,000	13,914,882
Field work	0	1,137,936	5,524,154	1,546,848	80,000	8,288,938
Information management	50,000	52,100	205,000	1,007,277	513,000	1,827,377
Research	705,970	494,376	319,752	1,596,469	682,000	3,798,567
Office space and utilities	724,242	735,344	393,498	533,720	0	2,386,804
Other direct expenses	1,005,461	609,891	272,209	166,223	0	2,053,784
Total direct expenses	13,318,553	12,838,564	14,756,623	15,559,891	1,669,100	58,142,731
Effective indirect expenses						
Total effective indirect ^d	1,976,705	1,911,319	1,172,951	2,220,991	6,906,900	14,188,866
Total effective indirect rate (%)	13	13	7	13	81	20
2010 EOY balance	369,742	24,117	165,208	(144,088)	0	414,979
Total Federal expense	15,665,000	14,774,000	16,094,782	17,636,794	8,576,000	72,746,576

EOY = end-of-year. FIA = Forest Inventory and Analysis. FRIA = Forest Resource Inventory and Analysis. FY = fiscal year. QA = quality assurance.

^a Some bookkeeping is not completed until after the new fiscal year begins, which may affect beginning balances. These adjustments, including items such as carryover, return of fire transfer, and station adjustments, are accounted for here.

^b An initial allocation of \$490,000 per station for experimental forests was reallocated to \$720,000 (Pacific Northwest), \$360,000 (Interior West), \$520,000 (Southern), and \$360,000 (Northern).

^c Grants and agreements include general allocation to basic categories plus allocation to Experimental Forests and Ranges.

^d Program charges for Albuquerque Service Center included in National Office indirect expenses.

Table B-3a.—Federal staffing (FTEs) for the FY 2010 FIA program.

	Pacific Northwest	Interior West	Southern	Northern	National Office ^a	Total
Administration	4.8	9.5	5.0	4.7	2.5	26.5
Phase 1 production work	0.0	1.0	7.0	6.5	0.0	14.5
Field support	12.9	13.2	6.1	8.8	0.0	41.0
Data collection	47.5	53.0	11.9	34.5	0.0	146.9
QA crew	4.7	2.7	15.9	7.4	0.0	30.7
Information management	12.6	10.0	11.0	16.6	0.0	50.2
Analysis	9.5	6.2	19.5	17.3	0.0	52.5
Techniques research	9.3	5.8	7.0	6.4	1.0	29.5
Total	101.3	101.4	83.3	102.2	3.5	391.7

FIA = Forest Inventory and Analysis. FTE = full-time equivalent. FY = fiscal year. QA = quality assurance.

^a Techniques person is in unit funded by National Office at Research Triangle Park, NC.

Table B-3b.—Estimate of cooperator staffing funded by FIA grants and agreements (FTEs) for the FY 2010 FIA program.

	Pacific Northwest	Interior West	Southern	Northern	National Office	Total
Administration	0.0	1.0	3.5	0.3	0.0	4.8
Phase 1 production work	0.0	0.0	0.0	0.3	0.0	0.3
Field support	0.0	1.0	8.9	3.1	0.0	13.0
Data collection	0.0	13.5	93.3	28.6	0.0	135.4
QA crew	0.0	0.2	0.2	0.0	0.0	0.4
Information management	1.0	0.8	0.0	6.1	6.0	13.9
Analysis	2.0	2.0	0.0	12.9	3.0	19.9
Techniques research	2.0	0.0	0.0	12.8	2.0	16.8
Total	5.0	18.5	105.9	64.1	11.0	204.5

FIA = Forest Inventory and Analysis. FTE = full-time equivalent. FY = fiscal year. QA = quality assurance.

Table B-3c.—Estimate of total federally funded staffing (FTEs) for the FY 2010 FIA program.

	Pacific Northwest	Interior West	Southern	Northern	National Office	Total
Administration	4.8	10.5	8.5	5.0	2.5	31.3
Phase 1 production work	0.0	1.0	7.0	6.8	0.0	14.8
Field support	12.9	14.2	15.0	11.9	0.0	54.0
Data collection	47.5	66.5	105.2	63.1	0.0	282.3
QA crew	4.7	2.9	16.1	7.4	0.0	31.1
Information management	13.6	10.8	11.0	22.7	6.0	64.1
Analysis	11.5	8.2	19.5	30.2	3.0	72.4
Techniques research	11.3	5.8	7.0	19.2	3.0	46.3
Total	106.3	119.9	189.2	166.3	14.5	596.2

FIA = Forest Inventory and Analysis. FTE = full-time equivalent. FY = fiscal year. QA = quality assurance.

Table B-4.—Partner contributions toward implementing FIA in FY 2010. (1 of 2)

Unit	Partner	Contributions toward the base program (\$)	Contributions that add value (\$)
Interior West Research Station	Colorado State Forest Service	0	230,149
	Montana State Department of Natural Resources	0	1,500
	NASA, Remote Sensing Science project	0	0
	NASA, Remote Sensing Science project	0	0
	Nevada Division of Forestry	0	1,200
	New Mexico State Forestry	0	411,000
	University of Montana, Bureau of Business and Economics Research	0	80,247
	USDA Forest Service Region 1	0	67,440
	USDA Forest Service Region 2	0	1,500
	USDA Forest Service Region 4	0	12,176
	Utah State Department of Natural Resources	0	750
IW total		0	805,962
National Office		0	0
NO total		0	0
Northern Research Station	Agriculture Research Service	0	95,000
	Connecticut	500	0
	Conservation Biology Institute	0	3,750
	Delaware Department of Agriculture	7,770	10,505
	Environmental Protection Agency/Great Lakes Restoration Initiatives	0	500,000
	Illinois Division of Forest Resources	23,359	0
	Indiana Department of Natural Resources	75,484	146,468
	Iowa Department of Natural Resources	18,680	0
	Iowa State University	0	20,476
	Kansas State Forest Service	62,963	0
	Maine Forest Service	189,382	233,905
	Maryland Department of Natural Resources Forest Service	12,300	0
	Massachusetts Department of Conservation and Recreation	8,200	0
	Michigan Division of Forest Management	40,200	0
	Michigan State University	37,310	0
	Michigan Technological University	0	21,934
	Minnesota Department of Natural Resources	231,000	369,956
	Mississippi State University	0	12,873
	Mississippi State University	0	9,865
	Missouri Department of Conservation	67,492	82,111
	National Council for Air and Stream Improvement	0	12,000
	Nebraska Department of Forestry, Fish, and Wildlife	5,853	0
	New Hampshire Department of Resources and Economic Development Division of Forests and Lands	20,400	0
	New Jersey	667	0
	New York Department of Environmental Conservation	19,890	0
	New York State University	0	20,143
	North Dakota Forest Service	8,795	0
	Ohio Department of Natural Resources	11,345	0
	Oregon State University	0	22,541
	Pennsylvania Department of Conservation and Natural Resources	43,000	0
	Resources Planning Act	0	30,000
	Rhode Island Department of Environmental Management	12,189	0
	Rutgers University	0	74,729
	Rutgers University/University of New Jersey	0	74,293
	South Dakota Department of Forestry and Natural Resource Management	11,092	0
	The Regents of the University of California	0	17,477
University of Massachusetts—Amherst	0	107,479	

Table B-4.—Partner contributions toward implementing FIA in FY 2010. (2 of 2)

Unit	Partner	Contributions toward the base program (\$)	Contributions that add value (\$)
	University of Minnesota	0	46,129
	University of Minnesota	0	50,850
	University of Minnesota	0	4,100
	University of Montana	0	53,621
	University of Nevada in Las Vegas	80,457	0
	University of New Hampshire	0	35,434
	University of New Hampshire	0	32,475
	University of Vermont	0	5,600
	University of Wisconsin	0	29,982
	USDA Forest Service Region 9	1,667	351,910
	USDA Forest Service State & Private Forestry Northern Area	6,700	75,900
	Vermont Department of Forests, Parks & Recreation	8,600	0
	West Virginia Division of Forestry	49,300	0
	Wisconsin Department of Natural Resources	49,702	526,535
	Yale University	0	12,738
	NRS total	1,104,297	3,090,779
Pacific Northwest Research Station	Alaska Department of Natural Resources	15,000	0
	California Department of Forestry	15,000	0
	Foreign Agricultural Service	47,500	0
	Oregon Department of Forestry	35,000	0
	Summer crew housing	0	5,000
	USDA Forest Service Region 5	50,000	30,300
	USDA Forest Service Region 6	0	75,600
	USDA Forest Service Region 10	0	73,506
	Washington State Department of Natural Resources	20,000	0
	PNW total	182,500	184,406
Southern Research Station	Alabama Forestry Commission	158,404	14,300
	Arkansas Forestry Commission	140,240	0
	Florida Department of Agriculture and Consumer Services	130,107	6,930
	Georgia Forestry Commission	174,000	17,160
	International Institute of Tropical Forestry EFR	140,000	0
	Kentucky Division of Forestry	316,493	27,610
	Mississippi Forestry Commission	121,837	8,690
	North Carolina Division of Forestry	0	17,160
	Oklahoma Division of Forestry	10,124	0
	South Carolina Forestry Commission	155,588	7,480
	Tennessee Department of Agriculture	132,526	35,640
	Texas Forest Service	336,243	7,260
	Virginia Department of Forestry	120,438	18,810
	Virginia Tech University	26,250	0
	University of Tennessee	25,001	0
	SRS total	1,987,251	161,040
Grand total, all FIA units		3,274,048	4,242,187

EFR = Experimental Forests and Ranges. FIA = Forest Inventory and Analysis. FY = fiscal year. IW = Interior West Research Station. NASA = National Aeronautics and Space Administration. NO = National Office. NRS = Northern Research Station. PNW = Pacific Northwest Research Station. SRS = Southern Research Station. USDA = U.S. Department of Agriculture.

Table B-5.—Grants and agreements entered into by FIA units, FY 2010. (1 of 3)

Unit	Amount (\$)	Recipient	Purpose
Interior West Research Station	687,936	Colorado State Forest Service	Implementation of annual FIA
	104,000	RMRS FWE Program	FIA soils indicator lead and sampling
	12,556	Colorado State University	Statistical support
	1,000	Utah State University	Webinar support
	11,100	NFS FVS support	FIA data linkages to FVS
	75,000	Smithsonian—GEOS	National agreement—for WO FIA
	450,000	TEAMS (enterprise team)	Implementation of annual FIA (funded fieldwork for 2011)
	51,122	Remote Sensing Application Center, NFS	Support for LANDFIRE
	40,000	NRS FIA	FIA Atlas project
	40,000	Experimental Forests and Ranges	Implementation of plot intensification
	49,698	Great Basin Experimental Range plots	Great Basin Experimental Range plots
	20,000	Great Basin Experimental Range plots	Great Basin Experimental Range plots
	10,000	Glacier Lakes Experimental Forest	GLEES Experimental Forest study
	62,000	Experimental Forests and Ranges	Experimental Forest and Range study
	60,000	Experimental Forests and Ranges	Priest River Experimental Forest plots
	10,000	Experimental Forests and Ranges	Priest River Experimental Forest archiving
	IW total	1,684,412	
National Office	80,000	International Institute of Tropical Forestry	Implementation of annual FIA
	30,000	National Council for Air and Stream Improvement	Imputation and modeling project
	400,000	University of Nevada in Las Vegas	Information management support
	45,000	Conservation Biology Institute	Protected areas database
	185,000	Redcastle Resources Inc.	RSAC FIA projects
	150,000	NatureServe/ESA	National Vegetation Classification System
	63,000	Virginia Tech University	FIA legacy database
	25,000	FHTET unit at Fort Collins, CO	Forest health imputation
	5,000	Forest Products Research RWU-4352	Nonwood products (Chamberlain)
	41,000	University of Wisconsin	Lichens research
	251,000	Research Triangle Park FHM Unit	National FHM support
NO total	1,275,000		
Northern Research Station	146,468	Indiana Department of Natural Resources	Implementation of annual FIA
	2,941	Iowa Department of Natural Resources	Implementation of annual FIA
	272,095	Jamison Professional Services	Implementation of annual FIA
	76,781	Kansas State University	Implementation of annual FIA
	467,380	Maine Forest Service	Implementation of annual FIA
	369,956	Minnesota Department of Natural Resources	Implementation of annual FIA
	5,389	North Dakota Forest Service	Implementation of annual FIA
	60,102	South Dakota Department of Forestry and Natural Resource Management	Implementation of annual FIA
	60,420	Daniel Huberty	Iowa plots
	18,900	Opportunity Partners	Document imaging services
	12,530	Opportunity Partners	Electronic scanning of FIA plots
	44,316	Quercus Consultants Inc.	Nebraska plots
	7,000	Lumberjack RC&D	Wisconsin plots
	4,000	Patrick Temple	Ozone field specimen samples
	7,500	Morris Arboretum	FIA Phase 2/Phase 3 plant specimen identification
	12,500	Edward Jepsen	Illinois plots
	45,043	University of Massachusetts	Ozone biomonitoring program
	12,000	Virginia Tech University	FIA legacy database
	207,264	Defense Information Technology Contract Organization	Senior developer for FIDO
	402,287	University of Nevada in Las Vegas	Information management
	27,000	University of Minnesota	FIA biomass estimation data access
	28,000	University of Vermont	High-resolution land cover
15,000	Conservation Biology Institute	Protected area database enhancement	

Table B-5.—Grants and agreements entered into by FIA units, FY 2010. (2 of 3)

Unit	Amount (\$)	Recipient	Purpose
	60,000	National Council for Air and Stream Improvement	Improving carbon online estimator for U.S. Greenhouse Gas Registry
	45,000	Oregon State University	Carbon content of dead wood
	30,055	Yale University	Sustaining Family Forests Initiative
	10,000	Northern Research Station Grand Rapids	Soil analyses
	29,268	New York State University	UFORE-Hydro: best management practices
	149,910	University of Wisconsin	Lichen supplemental
	69,528	Michigan Technological University	Developing new organic soil survey methods for peatlands
	99,981	University of New Hampshire	Quantifying disturbance effects on forest carbon local/regional/national scales
	312,813	University of Massachusetts—Amherst	Family Forest Research Center
	21,180	Mississippi State University	Developing oak decline/mortality and fuel model
	26,410	Mississippi State University	Forest health monitoring
	9,241	Purdue University	Natural resources measurements webinar series
	59,250	Michigan State University	Model enhanced estimates of standing dead tree abundance for FIA plots
	74,503	University of Minnesota	Deep soil carbon estimate
	93,000	University of Minnesota	Carbon efflux from woody debris
	125,000	University of Montana	Enhancing and planning national TPO program
	100,000	Rutgers University	Mapping above and below ground forest carbon
	74,943	Iowa State University	Oak regeneration policy
	120,000	Redcastle Resources	FIA Atlas
	85,000	University of Minnesota	Marcell Experimental Forest study
	63,415	University of New Hampshire	Barlett Experimental Forest study
	60,450	University of Maryland Baltimore	Baltimore LTER study
	63,400	Rutgers University/University of New Jersey	New Jersey Pine Barrens study
	63,375	University of California	Hubbard Brook Experimental Forest climate effects
NRS total	4,150,594		
Pacific Northwest Research Station	24,264	Oregon State University	Regional and national lichen analysis and QA/QC coordination
	67,874	Oregon State University	Using ancillary information and forest inventory
	14,000	Oregon Department of Forestry	Ozone injury detection and monitoring in Oregon forests
	50,000	Oregon Department of Forestry	Integration of ongoing FIA and forest assessment work
	300,000	University of Alaska, Fairbanks	Bonanza Creek Experimental Forest Study
	299,832	University of Hawaii at Hilo	Hawaii Experimental Tropical Forest
PNW total	755,970		
Southern Research Station	475,213	Alabama Forestry Commission	Implementation of annual FIA
	420,719	Arkansas Forestry Commission	Implementation of annual FIA
	436,420	Florida Department of Agriculture and Consumer Services	Implementation of annual FIA
	521,992	Georgia Forestry Commission	Implementation of annual FIA
	315,472	Kentucky Division of Forestry	Implementation of annual FIA
	487,349	Mississippi Forestry Commission	Implementation of annual FIA
	455,296	North Carolina Department of Environment and Natural Resources	Implementation of annual FIA
	177,305	Oklahoma Division of Forestry	Implementation of annual FIA
	466,765	South Carolina Forestry Commission	Implementation of annual FIA
	397,579	Tennessee Department of Agriculture	Implementation of annual FIA
	1,008,729	Texas Forest Service	Implementation of annual FIA
	361,315	Virginia Department of Forestry	Implementation of annual FIA
	100,000	University of Tennessee	Information management
	105,000	Virginia Tech University	Coop agreement assessment

Table B-5.—Grants and agreements entered into by FIA units, FY 2010. (3 of 3)

Unit	Amount (\$)	Recipient	Purpose
	140,000	International Institute of Tropical Forestry	Experimental Forest study
	65,000	South Carolina Forestry Commission	Experimental Forest plot work
	35,000	North Carolina Division of Forest Resources	Experimental Forest plot work
	79,752	University of Arkansas	Experimental Forest study
SRS total	6,048,906		
Grand total	13,914,882		

ESA = Endangered Species Act. FEW = Forest and Woodland Ecosystems. FHM = Forest Health Monitoring. FHTET = Forest Health Technology Enterprise Team. FIA = Forest Inventory and Analysis. FIDO = Forest Inventory Data Online. FVS = Forest Vegetation Simulator. GEOS = Global Earth Observing System. GLEES = Glacier Lake Ecosystem Experiments Site. IW = Interior West Research Station. LTER = Long Term Ecological Research. NFS = National Forest System. NO = National Office. NRS = Northern Research Station. NRS = Northern Research Station. QA/QC = quality assurance/quality control. RC&D = Resource Conservation and Development. RMRS = Rocky Mountain Research Station. RSAC = Remote Sensing Applications Center. RWU = Research Work Unit. TEAMS = a Forest Service Enterprise Unit. TPO = Timber Products Output. WO = Washington Office.

Table B-6.—Number and hours of significant consultations by FIA staff by customer group, FY 2010.

Customer group	Pacific Northwest		Interior West		Southern		Northern		National Office*		Total	
	No.	Hrs.	No.	Hrs.	No.	Hrs.	No.	Hrs.	No.	Hrs.	No.	Hrs.
Academic	20	225	171	445	47	259	65	785	3	15	306	1,729
Government	48	670	177	881	48	279	110	4,250	12	65	395	6,145
Industry	10	69	16	27	28	102	28	336	1	5	83	539
NGO	14	153	26	147	3	23	40	985	6	30	89	1,338
NIPF	2	4	1	24	6	35	3	17	2	10	14	90
Media	—	—	—	—	—	—	8	50	3	15	11	65
Other	15	72	13	114	47	242	16	40	2	7	93	475
	109	1,193	404	1,638	179	940	270	6,463	29	147	991	10,381

FIA = Forest Inventory and Analysis. NGO = Nongovernmental organization. NIPF = Non-industrial private forest.

Table B-7.—FIA data access by online tools and spatial data center requests, 2002–2010.

Indicator	Number of annual accesses										Total 2002–2010	
	2002	2003	2004	2005	2006	2007	2008	2009	2010			
Online tools												
MapMaker	11,579	14,577	26,034	55,062	22,906	24,073	20,834	25,000	—	—	200,065	
Forest Vegetation Simulator	—	396	514	763	566	497	683	—	—	—	3,419	
Fuel Treatment Evaluator	—	—	—	650	863	1,995	50	—	—	—	3,558	
Forest Inventory Data Online	—	—	—	—	—	—	38,092	55,494	70,943	—	164,529	
National Woodland Owners Survey	—	—	—	—	—	—	—	6,560	1,700	—	8,260	
EVALIDator	—	—	—	—	—	—	—	3,920	29,000	—	32,920	
DATA downloads	—	—	—	—	—	—	—	2,014	3,033	—	5,047	
Total	11,579	14,973	26,548	56,475	24,335	26,615	59,609	92,988	104,676	417,798		
Spatial data requests												
Academia	8	30	40	50	104	138	140	109	114	—	733	
State	3	12	20	31	31	44	48	49	47	—	285	
NFS	1	1	3	0	11	15	29	16	32	—	108	
Other Federal	16	36	50	71	174	182	135	105	116	—	885	
NGO	1	4	6	6	10	21	34	41	31	—	154	
Industry	0	7	10	13	14	39	29	28	35	—	175	
Other	0	5	15	20	3	54	68	57	48	—	270	
Total	29	95	144	191	347	493	483	405	423	2,610		

FIA = Forest Inventory and Analysis. NFS = National Forest System. NGO = Nongovernmental organization.

Table B-8.—*Mill, fuelwood, and ownership surveys processed and utilization sites visited, 2000–2010.*

Survey or site	Year initiated	Number of annual survey questionnaires or sites										Total 2000–2010
		2000–2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Timber products	1947	3,538	621	2,875	1,356	2,530	1,382	2,473	1,131	2,657	1,727	20,290
Fuelwood	1947	—	—	1,400	—	—	—	1,519	—	—	—	2,919
Ownership surveys	1978	—	2,781	4,388	3,662	—	6,450	—	—	—	—	17,281
Utilization sites	1947	—	32	100	142	252	99	147	486	17	66	1,341

Table B-9.—*Forest health indicator, year of initiation, and number of samples collected 2000–2010.*

Indicator	Year initiated	Number of annual samples										Total 2000–2010
		2000–2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Crowns	1991	783	525	831	1,018	1,044	966	1,059	925	1,050	NA	8,201
Lichens	1998	175	132	320	74	75	76	118	112	110	NA	1,192
Soils	1999	810	401	863	1,013	1,069	278	259	124	157	NA	4,974
Veg	2001	342	281	210	72	63	54	479	460	503	NA	2,464
Ozone	1994	1,279	634	661	649	649	643	636	629	646	NA	6,426
DWM	2001	529	662	1,108	3,808	3,777	3,703	4,126	3,655	3,835	NA	25,203

DWM = down woody material. NA = not available.

Table B-10.—*Status of FIA special project areas excluded from annualized inventory.*

Region and area	Land area in inventory (acres)	Forest area (acres)	Percent forest	Number of major islands	Year(s) of current inventory	Year(s) of published report	Total Phase 2 plots ^a	Total Phase 3 plots	Available online data
Pacific (PNW)									
American Samoa	48,434	43,631	90	4	2001	2004	21	—	Yes
Guam	135,660	63,833	47	1	2002	2004	46	—	Yes
Palau	110,028	90,685	82	10	2003	2007	54	—	Yes
Commonwealth of the Northern Mariana Islands	75,546	51,009	68	3	2004	1989	35	—	Yes
Federated States of Micronesia	161,917	143,466	89	10	2005–06	1986–87	73	—	Yes
Marshall Islands	33,182	23,230	70	10	2008	—	44	—	Yes
Hawaii	4,141,469	1,990,000	48	8	2010–19	1988	planned: 500	—	No
Atlantic (SRS)									
Commonwealth of Puerto Rico	2,191,815	1,260,625	57	3	2003	2007	373	61	Yes
U.S. Virgin Islands	85,590	52,478	61	3	2004	2007	73	40	Yes
Total	6,983,641	3,718,957	612	52			719	101	

FIA = Forest Inventory and Analysis. PNW = Pacific Northwest Research Station. SRS = Southern Research Station.

^a Partial suite of Phase 3 data collected on all plots in Pacific Region.

Table B-11.—Land and forest area and FIA annualized implementation status by state and region, FY 2006–2011.^a (1 of 2)

Region and State	Land area (Thousand acres)	Forest area (Thousand acres)	Entry date	2006	2007	2008	2009	2010	2011 (planned) (Thousand acres)
Northern									
Connecticut	3,101	1,794	2003	—	—	—	—	—	1,794
Delaware	1,251	383	2004	—	—	—	—	—	383
Illinois	35,580	4,525	2001	—	—	—	—	—	4,525
Indiana	22,957	4,656	1999	—	—	—	—	—	4,656
Iowa	35,760	2,879	1999	—	—	—	—	—	2,879
Kansas	52,367	2,106	2001	—	—	—	—	—	2,106
Maine	19,753	17,673	1999	—	—	—	—	—	17,673
Maryland	6,295	2,566	2004	—	—	—	—	—	2,566
Massachusetts	5,016	3,171	2003	—	—	—	—	—	3,171
Michigan	36,359	19,545	2000	—	—	—	—	—	19,545
Minnesota	50,955	16,391	1999	—	—	—	—	—	16,391
Missouri	44,095	15,078	1999	—	—	—	—	—	15,078
Nebraska	49,201	1,245	2001	—	—	—	—	—	1,245
New Hampshire	5,740	4,850	2002	—	—	—	—	—	4,850
New Jersey	4,748	2,132	2004	—	—	—	—	—	2,132
New York	30,223	18,669	2002	—	—	—	—	—	18,669
North Dakota	44,156	724	2001	—	—	—	—	—	724
Ohio	26,210	7,894	2001	—	—	—	—	—	7,894
Pennsylvania	28,685	16,577	2000	—	—	—	—	—	16,577
Rhode Island	668	356	2003	—	—	—	—	—	356
South Dakota	48,574	1,682	2001	—	—	—	—	—	1,682
Vermont	5,920	4,618	2003	—	—	—	—	—	4,618
West Virginia	15,415	12,007	2004	—	—	—	—	—	12,007
Wisconsin	34,761	16,275	2000	—	—	—	—	—	16,275
Southern									
Alabama	32,481	22,693	2001	—	—	—	—	—	22,693
Arkansas	33,328	18,830	2000	—	—	—	—	—	18,830
Florida	34,520	16,147	2001	—	—	—	—	—	16,147
Georgia	37,068	24,784	1998	—	—	—	—	—	24,784
Kentucky	25,428	11,970	1999	—	—	—	—	—	11,970
Louisiana	27,883	14,222	2000	—	—	—	—	—	14,222
Mississippi	30,025	19,622	2007	—	—	—	—	—	19,622
North Carolina	31,180	18,447	2003	—	—	—	—	—	18,447
Oklahoma	43,955	7,665	2008	—	—	—	—	—	7,665
South Carolina	19,272	12,746	1998	—	—	—	—	—	12,746
Tennessee	26,381	14,480	1999	—	—	—	—	—	14,480
Texas	167,626	60,273	2000	—	—	—	—	—	60,273
Virginia	25,343	15,766	1998	—	—	—	—	—	15,766
Interior West									
Arizona	72,732	18,671	2001	—	—	—	—	—	18,671
Colorado	66,387	22,612	2002	—	—	—	—	—	22,612
Idaho	52,960	21,430	2004	—	—	—	—	—	21,430
Montana	93,157	25,014	2003	—	—	—	—	—	25,014
Nevada	70,276	11,089	2010	—	—	—	—	—	11,089
New Mexico	77,674	16,682	2008	—	—	—	—	—	16,682
Utah	52,587	17,962	2000	—	—	—	—	—	17,962
Wyoming	62,147	11,445	2010	—	—	—	—	—	11,445

Table B-11.—Land and forest area and FIA annualized implementation status by state and region, FY 2006–2011.^a (2 of 2)

Region and State	Land area (Thousand acres)	Forest area (Thousand acres)	Entry date	2006	2007	2008	2009	2010	2011 (planned) (Thousand acres)
Pacific Northwest									
Alaska, coastal	39,041	13,718	2003	—	—	—	—	—	13,718
Alaska, interior	326,000	113,151		—	—	—	—	—	
California	99,824	32,817	2001	—	—	—	—	—	32,817
Hawaii	4,111	1,748	2010	—	—	—	—	—	1,748
Oregon	61,442	30,169	2000	—	—	—	—	—	30,169
Washington	42,612	22,279	2002	—	—	—	—	—	22,279
Total	2,263,230	794,227		—	—	—	—	—	681,076
Forest area performance measure, excluding interior Alaska (%)				89	92	96	96	100	100
Forest area performance measure, including interior Alaska (%)				76	78	82	82	86	86
State activity performance measure, including all active States (%)				88	90	94	94	100	100

FIA = Forest Inventory and Analysis. FY = fiscal year.

^a Based on area from Forest Resources of the United States, 2007 and on entry year into annualized inventory (revised Texas area).

Table B-12.—FIA summary statistics and performance measures, 2003–2010. (1 of 2)

	2003	2004	2005	2006	2007	2008	2009	2010
Available program funds								
Appropriated funds ^a	56,234	56,652	60,881	63,641	63,605	64,641	65,536	71,817
Other Federal funds ^b	3,437	6,073	1,776	1,775	1,272	1,559	3,320	930
Total Federal funds	59,671	62,725	62,657	65,416	64,877	66,200	68,856	72,747
Total partner funds	10,164	7,479	6,379	7,034	7,204	7,516	6,494	7,516
Total available funds	69,834	70,204	69,036	72,450	72,081	73,716	75,350	80,263
% Full Federal appropriated funding	74	75	80	84	84	85	87	90
Program expenses and balances								
Administration	3,172	3,430	3,065	3,104	3,031	2,785	2,999	3,262
Image processing	967	940	1,218	919	1,300	1,198	1,102	916
Field support	2,252	2,786	2,940	3,287	3,175	3,357	3,003	3,594
Data collection ^c	22,514	22,461	23,470	25,106	23,630	22,989	25,243	26,162
Information management ^c	6,719	9,448	7,394	6,890	7,431	6,108	7,623	7,476
Analysis	3,484	3,967	4,161	4,499	4,518	5,147	5,354	5,357
Research ^c	4,312	3,975	3,477	3,422	4,799	5,033	5,881	6,903
Miscellaneous/other	3,829	4,351	3,963	5,231	3,454	3,406	3,909	4,473
Total direct expense	47,249	51,357	49,687	52,458	51,338	50,023	55,115	58,143
Total indirect expenses	10,021	8,919	11,313	12,587	13,194	13,586	12,653	14,189
Total Federal expense	57,270	60,277	61,000	65,045	64,532	63,609	67,768	72,332
Fire transfer ^d	1,102	—	—	—	—	2,318	—	—
Total EOY balance	1,298	2,448	1,657	371	345	273	1,089	415
Total Federal funds	59,671	62,725	62,657	65,416	64,877	66,200	68,856	72,747
Category as % of total Federal funds								
Administration	5.3	5.5	4.9	4.7	4.7	4.2	4.4	4.5
Image processing	1.6	1.5	1.9	1.4	2.0	1.8	1.6	1.3
Field support	3.8	4.4	4.7	5.0	4.9	5.1	4.4	4.9
Data collection	37.7	35.8	37.5	38.4	36.4	34.7	36.7	36.0
Information management	11.3	15.1	11.8	10.5	11.5	9.2	11.1	10.3
Analysis	5.8	6.3	6.6	6.9	7.0	7.8	7.8	7.4
Research	7.2	6.3	5.5	5.2	7.4	7.6	8.5	9.5
Miscellaneous/other	6.4	6.9	6.3	8.0	5.3	5.1	5.7	6.1
Indirect	16.8	14.2	18.1	19.2	20.3	20.5	18.4	19.5
Fire transfer	1.8	—	—	—	—	3.5	—	—
EOY balance	2.2	3.9	2.6	0.6	0.5	0.4	1.6	0.6
Total % all categories	100	100	100	100	100	100	100	100
Grants as % of total Federal funds								
Fieldwork grants	14.4	10.1	9.6	11.8	11.3	11.4	11.5	11.4
Research grants	3.4	2.7	1.5	1.8	3.3	5.2	4.4	5.2
Data/information grants	2.6	4.1	2.0	1.7	2.7	2.5	2.9	2.5
Total % all Federal grants	20.4	16.9	13.1	15.4	17.3	19.1	18.8	19.1
Partner funds as % of total program funds								
All partner contributions	14.8	11.0	9.5	9.7	11.1	10.3	8.6	10.3
Other measures								
% States with annual activity	78	88	88	88	90	94	94	100
% States with FIADB 1–2 years old	28	56	80	84	90	90	90	88
Federal employees	403	426	447	410	387	389	381	392
Other employees	180	166	179	171	179	173	201	205
Total employees	583	592	626	581	566	562	582	596
P2/3 forest plots	17,182	16,036	15,675	18,245	19,880	18,208	21,545	19,272
P2/3 nonforest plots	29,592	29,532	24,445	24,190	24,757	29,351	21,996	25,238
Total plots	46,774	45,568	40,120	42,435	44,637	47,559	43,541	44,510

Table B-12.—*FIA summary statistics and performance measures, 2003–2010. (2 of 2)*

	2003	2004	2005	2006	2007	2008	2009	2010
All QA plots	2,332	2,874	3,584	3,382	3,664	4,860	3,597	4,020
% QA plots	5	6	9	8	8	10	8	9
All publications	138	114	164	182	135	172	206	203
Journal publications	23	25	34	45	37	65	38	74
% Journal publications	17	22	21	25	27	38	18	36
Consultations, number	1,450	1,566	1,510	1,608	1,571	1,659	1,399	991
Consultations, hours	4,514	4,899	5,612	5,527	5,767	6,656	8,603	10,381
User/mangement meetings	16	20	23	16	16	10	11	10
Spatial data requests filled	44	66	145	347	492	483	405	423
Online accesses	14,577	26,034	55,000	24,335	27,462	59,609	90,974	104,676

EOY = end-of-year. FIADB = Forest Inventory and Analysis Database. QA = quality assurance.

^a Net of rescissions.

^b Includes return of previous year carryover, return of fire transfers and additional Forest Service research commitments.

^c Includes Federal grants and agreements.

^d Before 2008, fire transfer included in "Indirect expenses."