



United States
Department of
Agriculture

Forest
Service



Forest Inventory And Analysis 1999 Business Summary



Contents

	<i>Page</i>
Introduction	1
1999 Program Highlights	2
Outputs and Products	2
Program Changes	3
Program Resources	4
State Partner Contributions	6
1999 Regional Highlights	9
Pacific Northwest (West Coast)	9
Interior West	9
North Central	10
Northeast	10
South	10
National Office	11
Criteria and Indicators of Sustainability	12
Grants and Agreements	13
Comparing 1999 FIA Accomplishments With Our 1998 Goals	14
2000 FIA Program Direction	15
Long-Term Strategic Direction	17
Conclusions	18
Appendix	19
Glossary of Terms Used in Report Tables	19
Tables (1-4)	21

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact the USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue SW, Washington, DC 20250-9410, or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.



United States
Department of
Agriculture

Forest
Service

Washington
Office

14th & Independence SW
P. O. Box 96090
Washington, DC 20090-6090

File Code: 4000

Date: APR 6 2000

Dear FIA Partners:

The Forest Inventory and Analysis (FIA) program is the key Forest Service program that provides the information needed to assess the sustainability of the Nation's forests. We collect and report information on status and trends in most of the Nation's forested ecosystems, addressing topics such as the extent, size, and species composition of forests; forest growth and mortality rates; forest land ownership patterns; and rates and efficiency of wood utilization. This information is vital for a wide array of customers drawn from public and private environmental organizations, business enterprises, researchers, consultants, and private citizens.

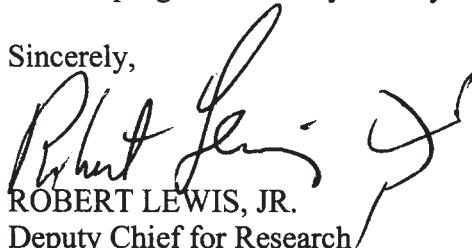
This business report summarizes program activities in fiscal year 1999, covering the period October 1, 1998, through September 30, 1999. It is intended to provide our customers and stakeholders with a snapshot of past activities and future program directions. Major accomplishments in 1999 included:

- Implementation of annual inventories in 3 new states. Annual inventories are now implemented in 21 percent of the Nation's forests.
- Visited 9,573 field plots, an increase of 14 percent over last years accomplishment of 8,382 plots.
- Published 91 publications and reports on the Nation's forested resources, an increase of 4 publications over 1998.
- Held 8 user group meetings to listen to customers and incorporate their feedback into our future plans.

In 2000 we intend to double the amount of the country covered by annual inventory systems, to 42 percent; continue to close out periodic inventories in 9 states; complete the field integration of FIA and FHM; review our experience and needs with respect to utilization of remote sensing technology in FIA operations; and continue to reduce the reporting cycle toward the target of one report per state every five years.

The success of the FIA program depends upon the support of our customers and partners. On behalf of the FIA program I thank you for your continued support.

Sincerely,



ROBERT LEWIS, JR.
Deputy Chief for Research
& Development



INTRODUCTION

The Forest Inventory and Analysis (FIA) program of the USDA Forest Service provides the information needed to assess the status, trends, and sustainability of America's forests. This report, which summarizes program activities in fiscal year 1999 (October 1, 1998, through September 30, 1999), gives our customers and partners a snapshot of past activities, current business practices, and future program directions. It is the second in our series of annual reports 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 U.S.; if you are interested in such information, please contact the appropriate regional or national FIA office listed on the back cover of this report.)

The FIA program collects, analyzes, and reports information on the status and trends of America's forests: how much forest exists and where, who owns it, and how is it changing, as well as how the trees and other forest vegetation are growing and how much has died or been removed 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, and supporting planning and decisionmaking activities undertaken by public and private enterprises. The FIA program combines this information with related data on insects, diseases, and other types of forest damage to assess the health and potential future risks to forests. The program also projects what forests are likely to be like in 10 to 50 years under various scenarios. This information is essential for evaluating whether current forest management practices are sustainable in the long run, and whether current policies will allow our grandchildren and their grandchildren to enjoy America's forests as we do today.

Based on partner and customer feedback to our first business report in 1998, we made the following changes for the 1999 report:

- ❑ Moved the detailed financial and performance summary tables to the back of the report, and added summary graphics to the body of the report.
- ❑ Added a discussion and summary table showing our investments in extramural research through grants and agreements, with specific attention to research in remote sensing applications.
- ❑ Added a summary of how the FIA program addressed Criteria and Indicators of Sustainability.
- ❑ Addressed the merger of the plot component of the Forest Health Monitoring (FHM) program with the FIA program. Starting in 2000, FIA annual business reports will include financial and accomplishment summaries for this enhanced FIA program. This 1999 report is the last to focus strictly on the "old" FIA program.
- ❑ Added a section dealing with long-term goals and performance measures as required by the Government Performance and Results Act (GPRA).

Originally, we proposed changing the name of the new FIA program to "Forest Inventory and Monitoring" (FIM) to reflect our changes and the incorporation of the plot component of FHM. However, based on feedback from partners and customers who opposed losing the "brand recognition" associated with the FIA name, as well as some concern over negative implications of the word "monitoring," we have chosen to retain the name "Forest Inventory and Analysis."

1999 PROGRAM HIGHLIGHTS

Outputs and Products

The FIA program produced 91 publications in 1999, four more than in 1998. The 1999 publications included 1 State statistical report, 3 State analytical reports, and 10 timber product output reports (table 1 in the appendix). We were active in 21 States in 1999 (fig. 1), visiting 9,573 sample plots corresponding to 7.8 percent of our base grid of sample plots. The FIA sample population of interest currently includes 95 percent of the forest lands of the U.S. or all forested lands except national forests in Oregon, Washington, and California, which are inventoried by the respective national forest managers. At the end of 1999, 21 percent of the Nation was covered by the new annual FIA program. Figure 2 shows the total acres as well as forest acres inventoried annually in 1995-1999. The dramatic increase in acres inventoried in 1999 shows the effect of our transition to an annual inventory, which covers more of the country (but at a lower level of precision) each year.

FIA staff made over 130 presentations at various meetings of resource professionals, private landowner associations, industry groups, and scientists. We continued to develop our Internet-accessible web pages for all regional FIA units as well as a national homepage. On our homepage, we posted documents for review and directed users to our online databases and other resources.

We worked closely with the White House to write the forest section of “Designing a Report on the State of the Nation’s Ecosystems,” a prototype for a national annual report on the status and trends of the Nation’s forest, cropland, and coastal marine environments. Work continued on a new national database for the Resource Planning Act (RPA) 1997 Assessment, which combines FIA data with other data to provide a complete snapshot of the status of U.S. forest resources as of 1997. The 1997 RPA database and our Timber Product Output (TPO) database were made available on our national web site in 1999.

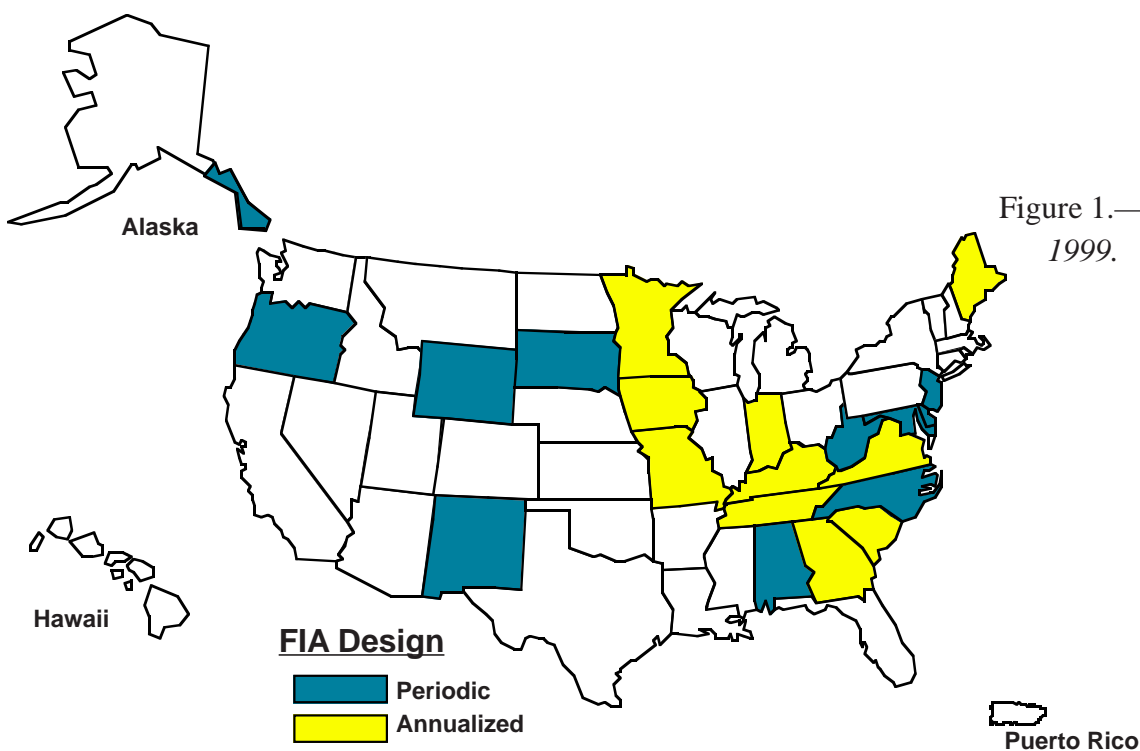


Figure 1.—States with fieldwork, 1999.

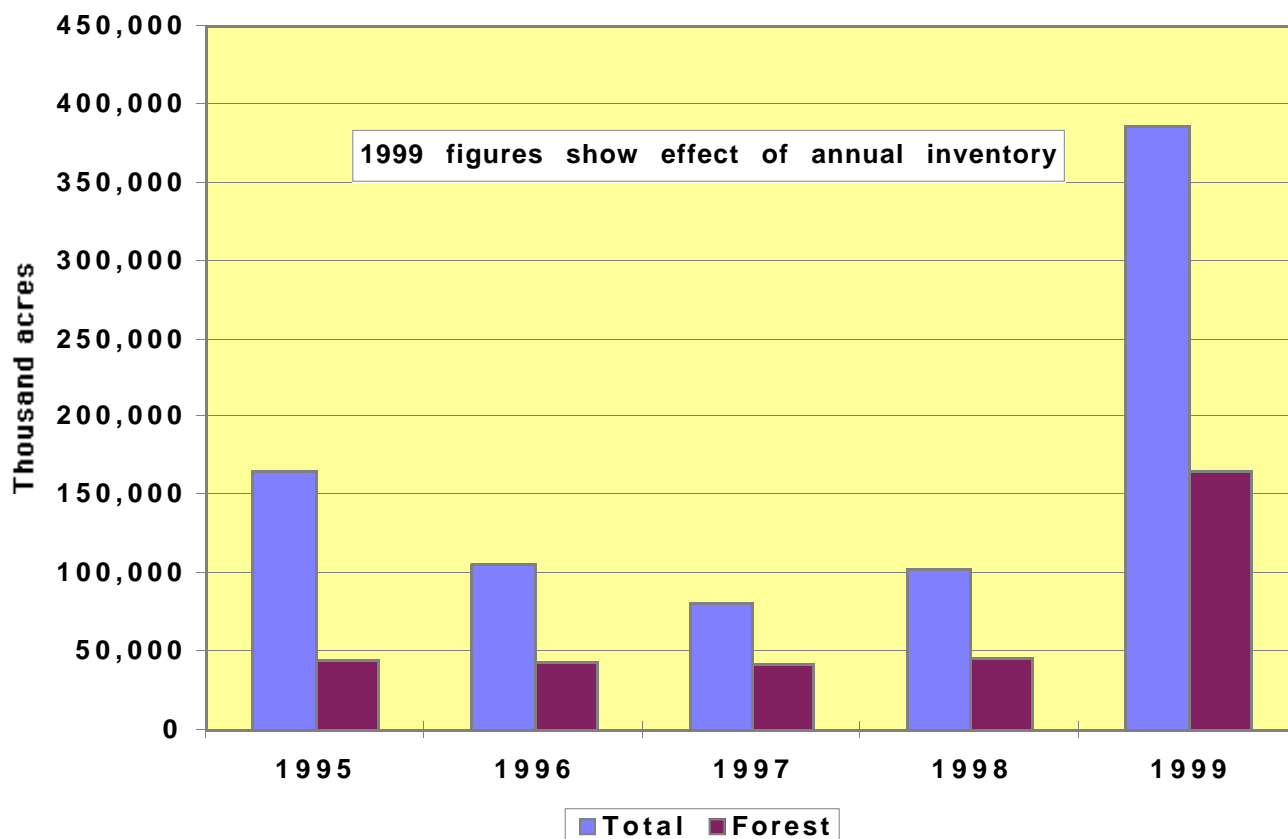


Figure 2.—Total acres and forest acres inventoried/year, 1995-1999.

Table 1 shows some comparisons across FIA regional units in the rates, cost, and performance of implementing the FIA program. The figures for cost per plot include the entire Federal program cost, including planning, data collection, data management and analysis, reporting, and management. Average Federal cost per plot across all regional units in 1999 was \$2,844/plot, down from \$2,932/plot in 1998. Costs ranged from about \$1,800 per plot in the Southern U.S. (where crews work 12 months per year due to modest terrain and moderate weather, and where States contribute significantly to the cost of conducting fieldwork), to \$3,700 per plot in the Interior West (where field seasons are shorter due to harsh weather and where access is more difficult), to over \$7,600 per plot in the Pacific Northwest (reflecting the higher costs of fieldwork in Alaska, where the most efficient means of data collection often involves use of helicopters to fly crews to sample locations). Nationally, the program measured approximately 7.8 percent of

field sample locations in 1999, up from 6.9 percent in 1998, ranging across the country from 2.3 percent in the Northwest to 11.6 percent in the South. This variation reflects both historical differences in Federal budget allocations by region as well as differences in the willingness of non-Federal partners to contribute funds to support the program; it is expected to even out as we approach full funding for the FIA program.

Program Changes

In 1999, the FIA program continued the changes mandated by the Agricultural Research, Extension, and Education Reform Act of 1998 (Public Law 105-185). We delivered to Congress a Strategic Plan for Forest Inventory and Monitoring as required by the law, which described steps, costs, and timelines for changing to the new inventory system. This plan was

written with extensive input from a variety of partners, which resulted in some key changes, such as including State Foresters and their staffs in all levels of direct FIA program management and creating regional and national FIA user groups to systemize the inclusion of customer feedback in determining future FIA direction.

The Strategic Plan called for a total program budget of \$82 million per year to deliver a federally funded program meeting the full objectives of the legislation. This represented an increase of approximately \$45 million above the level of funding available in 1999 (factoring in anticipated contributions from State and Private Forestry and the National Forest System of the Forest Service). However, in discussions with our partners, we identified an acceptable, lower cost alternative calling for reduced annual sampling of 10 percent of all sample locations per year in Western States and 15 percent per year in Eastern States, with full reporting at 5-year intervals. Any State would have the option to contribute the resources necessary to bring the program up to the full sample intensity of 20 percent per year. The east-west split was a compromise to address the higher cost of sampling in the Western States due to difficulties of access.

The Strategic Plan also addressed integrating the Forest Health Monitoring (FHM) program with the FIA program. FHM is a Forest Service - State partnership that reports on status and trends in forest ecosystem health. It includes a plot sampling component similar to FIA in concept, with a broader suite of forest health indicators measured on a smaller sample of plots. In 1999, we agreed to merge the plot component of FHM with the FIA program, creating an enhanced FIA program that now includes three sample levels: Phase 1 consisting of remote sensing, phase 2 consisting of the original set of FIA plots (approximately one plot per 6,000 acres), and phase 3 consisting of a subsample of FIA plots measured for a broader suite of indicators (approximately one sample

location per 94,800 acres). The remaining components of the FHM program, including aerial damage surveys, evaluation monitoring, and intensive site/long-term ecological monitoring, will continue as a separate but related FHM program. Starting in 2000, FIA will be managed as a single program for all three phases. The current 1999 annual report includes information for only the phase 1 and 2 portions of the program; starting in 2000, we will include information for phase 3.

In 1999, we continued to move towards increasing national consistency. A core field manual for phase 2 plot measurements was implemented along with annual inventory in Maine in April 1999, and will be implemented in all other regions of the country as each FIA regional unit begins its next State. A permanent standing team will keep the manual current and is working to incorporate the existing core phase 3 indicators and to develop core quality assurance procedures. Other technical teams are working on developing core information management systems, compilation and analysis procedures and algorithms, remote sensing and image analysis procedures, and sample design documentation. In 1999, we developed and began to implement a single core sample grid for phase 2 and phase 3 plot locations. This grid provides a standardized systematic approach, based on an intensification of the FHM grid, with a constant sampling intensity of about 6,000 acres per phase 2 field plot. We expect that the increased consistency from this core program, when completed, will save approximately \$750,000 per year in analysis time for internal and external users who aggregate data across administrative boundaries. Individual regions or States will be able to add to the core program to address local needs.

Program Resources

Federal appropriated funding for FIA increased by \$3,944,912 from \$19,825,000 in 1998 to \$23,796,912

in 1999 (table 2 in the appendix). This is approximately 40 percent of the total Federal funds of \$58.9 million in 1999 dollars needed to fully fund the Federal share of the proposed 10 percent/15 percent base Federal program. This funding was augmented by a total of \$3,478,669 contributed by various other Forest Service (mostly National Forest System regions) and external sources, plus \$667,504 brought forward from fiscal year 1998, for a total 1999 available funding level of \$27,943,085. The Federal funds available make up approximately 47 percent of the funds needed to implement the base Federal program.

Of the funding available, approximately 80 percent was spent in direct support of FIA activities; 17

percent was spent on indirect costs charged by Research Stations (down from 18 percent in FY 1998); and 3 percent was carried forward to fiscal year 2000 (fig. 3). Figure 4 shows the appropriated and total funding available for FIA from 1995 to 1999, as well as the projected future total funding needed to deliver the 10 percent/15 percent base Federal program.

Across FIA regions, cost and productivity figures vary because of the cyclical nature of the current inventory system and because of differences in operational methods between units. Rates of indirect costs range from about 11 to 17 percent across the country, reflecting differences in both sources of funding as

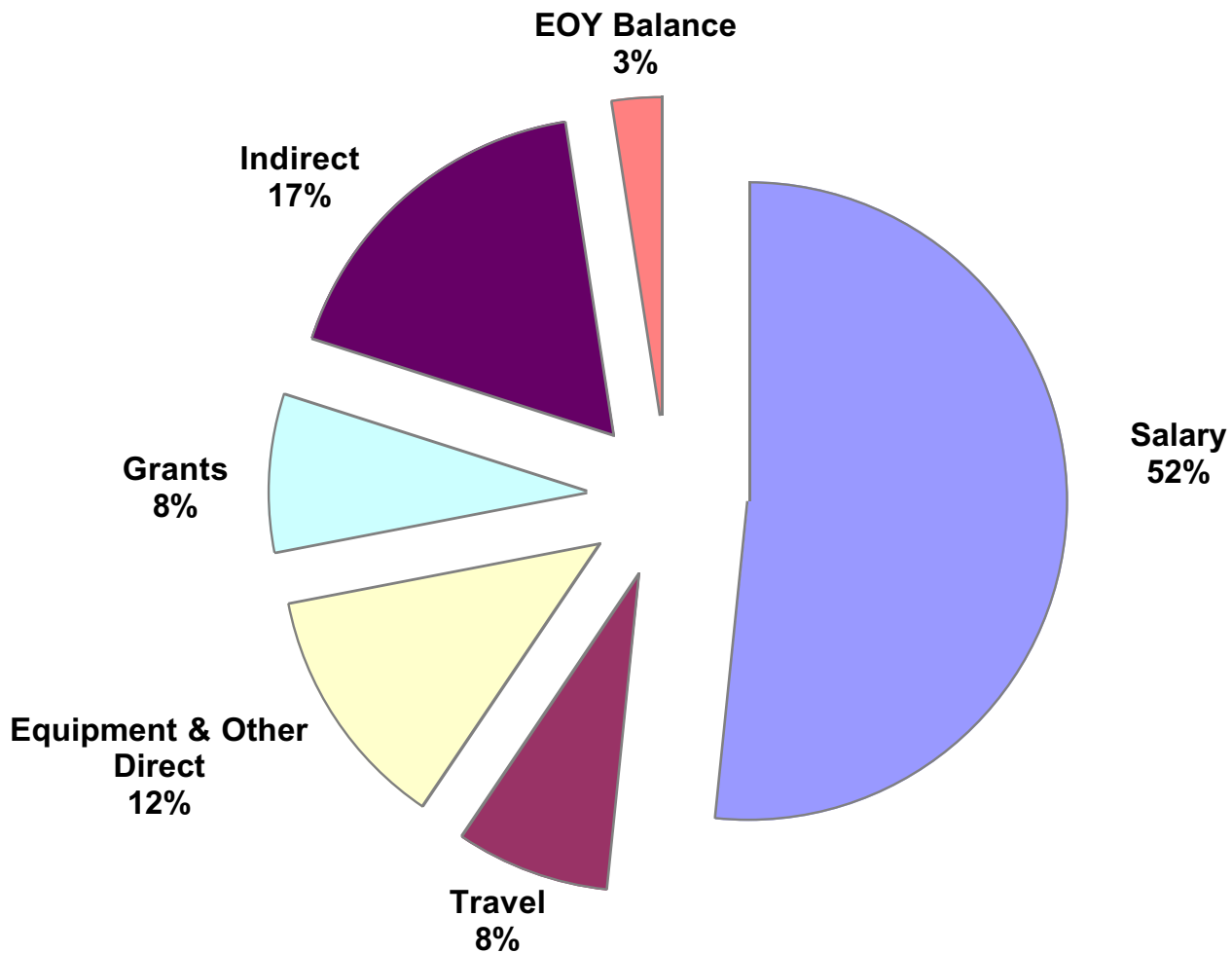


Figure 3.—1999 expenditures by category.

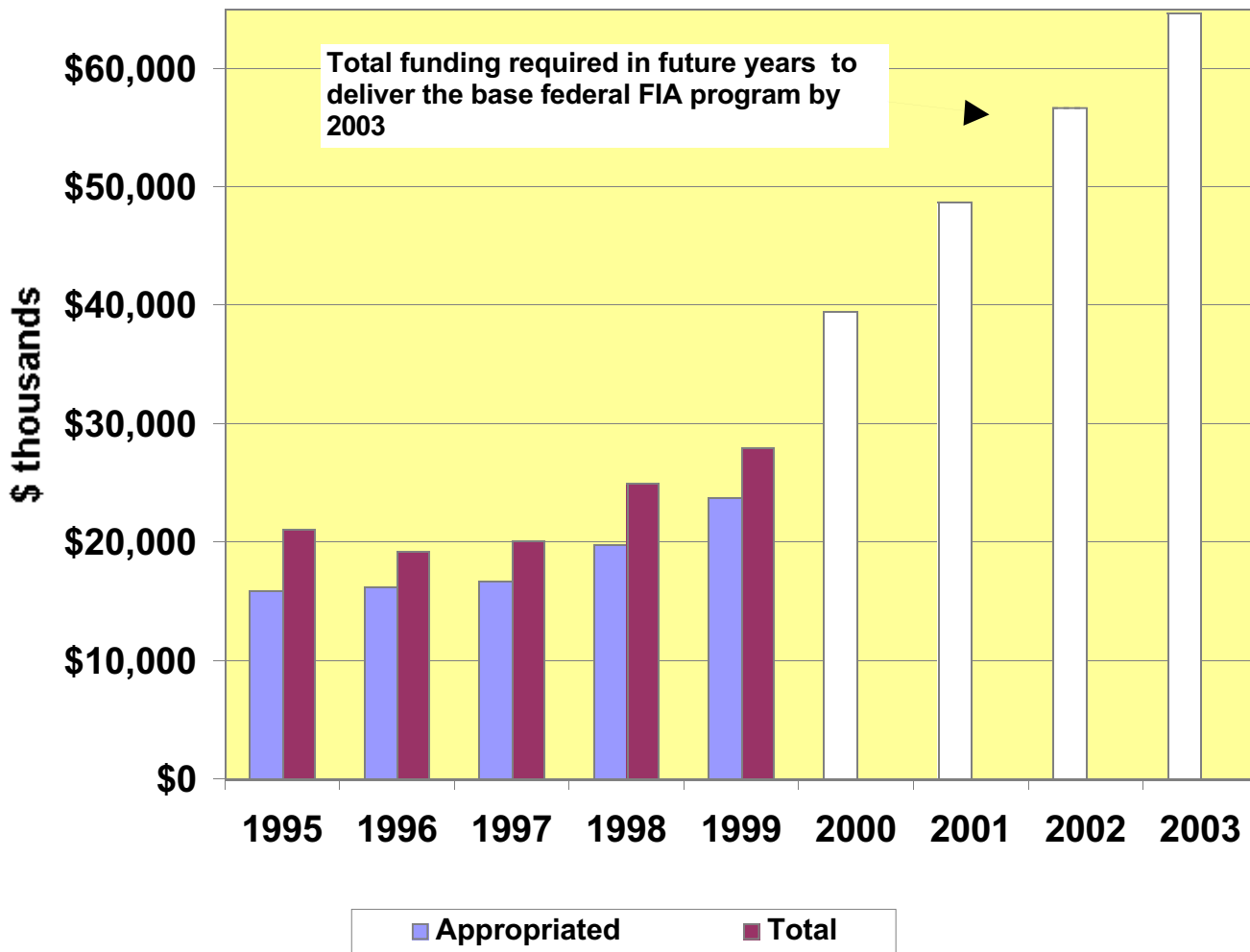


Figure 4.—Appropriated and total funds available, 1995-1999+.

well as Station policies. For example, some Stations assess different rates of indirect costs for Federal and non-Federal funds. The Washington Office has a 78-percent rate of indirect cost because its FIA budget includes the U.S. Department of Agriculture overhead assessed to the entire FIA program.

FIA program staffing consisted of 296 Federal person-years of effort in 1999 (table 3 in the appendix), down from 307 Federal person-years in 1998. This decrease reflects an increase in the participation of State crews in field data collection in the Southern FIA unit. Of the Federal FIA employees, 51 percent were involved in the supervision and collection of field data, 35 percent in analysis and information management, 5 percent in techniques research, and 9

percent in program management and administration (fig. 5).

State Partner Contributions

The complete FIA program required by Congress is envisioned to be a Federal-State partnership, with both partners contributing resources to accomplish the work. We have agreed that the base Federal share of this program is an annual inventory program that collects data from 10 percent of sample locations in the Western U.S. and 15 percent of the sample locations in the Eastern U.S. on an annual basis, with reports for all States produced at 5-year intervals.

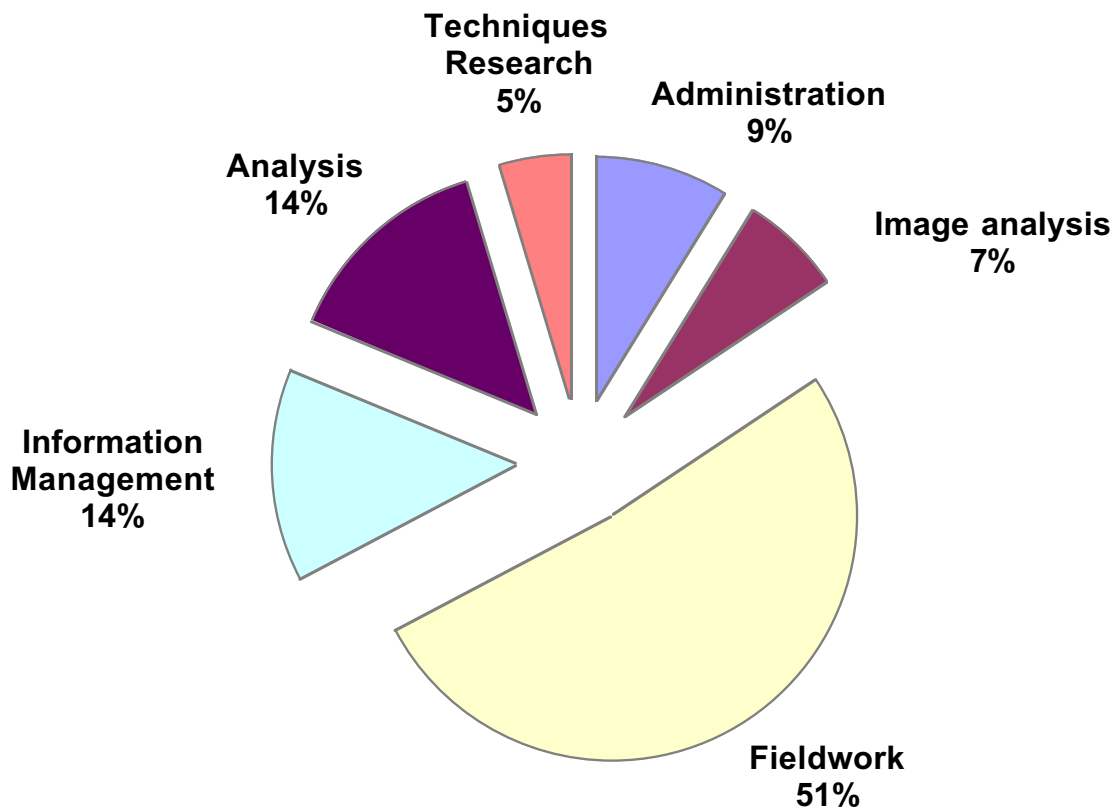


Figure 5.—Federal person-years by category.

State partners at their discretion 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. Additionally, or alternately, State partners may choose to contribute resources for other purposes that add value to the FIA program, such as by intensifying the base FIA sample location grid to support analysis at finer spatial resolution; by funding additional types of measurements on FIA sample locations; or by providing analyses or reporting beyond that provided by FIA. The willingness of partners to contribute resources demonstrates the inherent value of the FIA program.

The following tabulation lists those States that have chosen to contribute resources to the implementation of the FIA program, either to achieve the 20-percent program or to add value in other ways. These resources include staff time, vehicle use, office space, equipment, travel costs, and other non-cash items that support or add value to the FIA program. Contributions are valued in terms of what it would cost the Federal FIA staff to provide the same service, which may not necessarily be the same as the actual cost to the State making the contribution. Cash contributions to FIA units from States are documented in table 2. Overall, States contributed \$3,177,600 in in-kind resources towards implementing the Strategic Plan and \$1,408,289 for additional FIA-related activities that add to the value of the program:

Partner	In-kind contributions to the base program	Value added contributions
Northeast		
Maine Forest Service	\$ 459,600	
North Central		
Illinois Department of Natural Resources	\$ 19,000	
Indiana Department of Natural Resources	\$ 33,000	
Iowa Department of Natural Resources	\$ 17,000	
Kansas Forest Service	\$ 18,000	
Michigan Department of Natural Resources	\$ 402,000	
Minnesota Department of Natural Resources	\$ 121,000	\$ 547,289
Missouri Department of Conservation	\$ 72,000	\$ 60,000
Nebraska Forest Service	\$ 7,000	
North Dakota Forest Service	\$ 4,000	
South Dakota Division of Resource Conservation & Forestry	\$ 10,000	
Wisconsin Department of Natural Resources	\$ 55,000	\$ 250,000
TOTAL, NORTH CENTRAL	\$ 758,000	\$ 857,289
South		
Alabama Forestry Commission	\$ 690,000	
Georgia Forestry Commission	\$ 366,000	
Kentucky Division of Forestry	\$ 160,000	\$ 278,000
South Carolina Forestry Commission	\$ 140,000	\$ 173,000
Tennessee Division of Forestry	\$ 347,000	
Virginia Department of Forestry	\$ 251,000	\$ 100,000
TOTAL, SOUTH	\$ 1,954,000	\$ 551,000
Pacific Northwest		
Oregon Department of Forestry	\$ 6,000	
GRAND TOTAL, ALL REGIONS	\$ 3,177,600	\$ 1,408,289

1999 REGIONAL HIGH-LIGHTS

The following section presents general information on the types of activities completed in each part of the country in 1999. For more detailed information on results, accomplishments, and impacts, please contact the respective FIA unit.

Pacific Northwest (West Coast)

In 1999, the Pacific Northwest Research Station unit continued periodic inventory fieldwork in Alaska and Oregon—the fifth year of installing permanent forest inventory plots in southeast and south-central Alaska in cooperation with the Alaska Region of the Forest Service. The Alaska inventory is being conducted consistently across all ownerships. We began the ground plot phase of a remeasurement project in beetle-killed spruce stands on the Kenai Peninsula that will provide data for a comparison of the extent and condition of the forest from 1987 to 1999.

The final periodic inventory in Oregon was completed with fieldwork in eastern Oregon timberlands and juniper lands. We initiated a study with the Forest Health Protection Staff of the Pacific Northwest Region of the Forest Service to test the use of low elevation photography and videography for inventorying the juniper woodlands in eastern Oregon. We also completed a comparison of land use change over 30 years in western Oregon in cooperation with the Oregon Department of Forestry and the Oregon Department of Agriculture.

We held our second user group meeting in Portland, Oregon, in August 1999, focusing on presenting and discussing options for moving to the annual forest inventory approach. We also attended the annual meeting of the Pacific Islands Committee of the

Western Council of State Foresters to discuss how the national inventory program relates to the needs of the Islands. The group developed a plan to move toward implementation of the FIA program in Hawaii and the Pacific Islands.

Analysis in 1999 focused on evaluating methods and issues related to non-timber variables such as coarse woody debris and understory vegetation. These two variables are being considered for adoption as national variables and are essential components of habitat suitability, carbon sequestration, fire hazard, and biodiversity. The PNW unit produced 19 publications in 1999, mostly papers in peer-reviewed journals and conference proceedings.

Interior West

The Rocky Mountain Research Station FIA unit continued periodic inventory fieldwork in Wyoming, South Dakota, and New Mexico, including national forest lands in these States through agreement with National Forest System (NFS) Regions 1, 2, and 4. We produced a number of reports specific to individual national forests, demonstrating the usefulness of FIA data to national forests for strategic planning and resource characterization. We conducted a research study in cooperation with Utah State University to develop models for forest inventory variables as functions of satellite-based information for mapping and stratification. The Rocky Mountain unit produced four publications in 1999 including an analytical report for the State of Utah, the first FIA report that includes data collection and analysis for all forest lands regardless of ownership or reserve status.

The Rocky Mountain Research Station also supports a mathematical statistics research unit in Fort Collins, Colorado, which conducts research on new inventory methods aimed at increasing efficiency and effectiveness of forest inventory across the United States, with

particular reference to the FIA program. In 1999, this unit produced eight publications including six in peer-reviewed journals. Topics included annual FIA, remote sensing, surveys of rare species, and estimation procedures using FIA data. Other unit accomplishments include conducting a major cooperative study with the USDA Natural Resources Conservation Service and the Minnesota Department of Natural Resources to better integrate inventory methods; organizing a national meeting of biometricians to consider short-term use of moving averages for annual FIA estimates; developing an extensive statistical simulation population to bench-test methods that integrate time-series of annual FIA data; and working with an interagency team of scientists and Forest Service managers to design inventory and monitoring approaches for public lands in the Western U.S., including a strong FIA component.

North Central

The North Central Research Station FIA unit conducted annual inventory fieldwork in Indiana, Iowa, Minnesota, and Missouri. The North Central unit is the first to complete the transition to annual inventory; all inventory conducted by NCFIA beginning in 1999 will be done using the annual approach. We focused the entire unit on meeting the annual inventory requirements of the Farm Bill by rewriting our charter (research work unit description) around the annual approach. We led the national effort to develop the first county-level database of timber product output (TPO) information in the country in support of the 1997 RPA. We continued collaborative research with the University of Minnesota and with the Minnesota Department of Natural Resources on methods for an annual forest inventory system, including cooperative research into k-Nearest Neighbor techniques and other uses of satellite imagery for producing forest-nonforest maps. We attended the long-standing annual meeting of the NC user group in Madison, Wisconsin.

In 1999, the North Central unit produced 17 publications including State analytical reports for Kansas and North Dakota.

Northeast

The Northeastern Research Station FIA unit completed periodic fieldwork in New Jersey and began periodic fieldwork in Delaware, Maryland, and West Virginia. These will be the final States inventoried under the periodic system. We also implemented annual inventory fieldwork in Maine in cooperation with the Maine Forest Service, and we were the first unit to use the National Core Field Guide in an operational mode. The Northeast unit participated in a multi-agency assessment of the Delaware River Basin and continued planning for the implementation of the next National Ownership Study, scheduled to begin in 2001. We conducted several studies integrating satellite imagery with ground data to look at forest fragmentation and coverage in new England as well as forest cover change in Maryland. The unit produced 12 publications in 1999 including five State timber product output reports.

South

The Southern Research Station FIA unit completed periodic inventory fieldwork in Tennessee, continued periodic inventory fieldwork in North Carolina and Alabama, implemented annual fieldwork in Tennessee and Kentucky, and continued annual inventory fieldwork in Virginia, Georgia, and South Carolina.

The Southern program continued to provide national leadership in developing and maintaining World Wide Web applications including the national FIA homepage and the online databases for State inventories, the Resource Planning Act, and Timber Product Output data. We initiated an extramural remote

sensing proposal competition, in cooperation with the National Center for Air and Stream Improvement (NCASI) and the national FIA office, to generate fresh ideas for how we might use modern remote sensing technology to either generate new products demanded by customers or to increase the efficiency of our current program. We attended approximately six different regional user group and partner meetings, mostly focused on logistic details of cooperative implementation of annual FIA. The unit produced 30 publications including one State statistical report and five State timber product output reports.

National Office

The National Office of the FIA program provides coordination, oversight, and guidance to the FIA field units engaged in implementing the enhanced FIA program. In 1999, we organized, facilitated, and documented two FIA Executive Team meetings, three FIA Management Team meetings, one national FIA technical workshop, and dozens of briefings for internal and external partners, customers, collaborators, and supporters. We organized an internal research proposal competition to award funds to units for applied research aimed at increasing the use of satellite imagery and other remote sensing tools, and

we collaborated with the Southern FIA unit in establishing an external competition in cooperation with the National Center for Air and Stream Improvement (NCASI) to solicit outside proposals for improving our use of remote sensing.

In 1999, we continued to enhance the national FIA web site maintained on behalf of the FIA program by the Southern FIA unit. We added a section describing the current status of FIA program implementation, and we started an online “scrapbook” showing examples of uses of FIA data geared towards national forests to demonstrate how our information is used at a sub-State level.

National Office staff also participated in many national and international activities involving the FIA program. We continued to prepare the 1997 Resource Planning Act (RPA) report, and we collaborated in preparing the Vice President’s Report Card on the Environment. We completed U.S. submissions to the United Nation’s Food and Agriculture Organization (FAO) for inclusion in the FAO Global Forest Resource Assessment 2000. We organized a forest inventory study group for North America sponsored by FAO, and we provided technical assistance to the Government of Argentina and to U.S. Agency for International Development staff in Panama.

CRITERIA AND INDICATORS OF SUSTAINABILITY

Forest monitoring is key to achieving sustainability over the long term. Monitoring provides the quantitative measures needed to ascertain if our current policies and practices are improving, maintaining, or threatening forest sustainability. The Forest Service is committed to using the Montreal Process Criteria and Indicators of Sustainability (C&I) for both international reporting and for communicating with U.S. partners. The 67 Indicators are grouped into 7 Criteria that describe key biological, socioeconomic, and institutional dimensions of forest sustainability.

FIA is the main program in the United States for providing statistically reliable data on many of these Indicators at the regional and national scale. For each of the seven Criteria, the following tabulation shows the total number of corresponding Indicators for that Criterion, the number of Indicators expected to be fully or largely addressed by FIA at the State level, and the number of Indicators for which FIA will provide some but not all information. As shown below, FIA is heavily oriented towards the first five biological Criteria, providing some or most information about 26 of the 28 Indicators in these Criteria. FIA is not designed to provide substantial information about socioeconomic or institutional Criteria. The Indicators addressed by FIA are:

Criterion	Number of Indicators	Indicators addressed by FIA	Indicators partly addressed by FIA
I. Conservation of biodiversity	9	5	4
II. Maintenance of productive capacity of forest ecosystems	5	4	1
III. Maintenance of forest ecosystem health and vitality	3	2	1
IV. Conservation and maintenance of soil and water resources	8	3	3
V. Maintenance of forest contribution to global carbon cycles	3	3	0
VI. Maintenance and enhancement of long-term multiple socioeconomic benefits	19	2	7
VII. Legal, institutional, and economic framework	20	2	1
TOTAL	67	21	17

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. Table 4 in the appendix lists the major grants and agreements funded in FY 1999.

Many of these grants and agreements relate to conducting applied research and development into the use of advanced remote sensing and image processing technology for either increasing the efficiency of the FIA program or for developing new products to offer our customers. In 1999, we awarded \$735,564 to fund 16 agreements with 14 institutions for research and development along these lines. This investment is in addition to our own internal research and development efforts. We are presently drafting a white paper that will summarize FIA experience and research to date with remote sensing.

The remainder of table 4 shows the \$1,550,585 we awarded to fund 18 agreements with 15 institutions for collecting, analyzing, reporting, and distributing FIA information. Together, grants and agreements total \$2,286,149 or approximately 8.2 percent of the total funds available to the FIA program.

COMPARING 1999 FIA ACCOMPLISHMENTS WITH OUR 1998 GOALS

In the 1998 annual business report for FIA, we included a section stating our plans for fiscal year 1999. Below we show how our actions in 1999 matched our promises in 1998.

In the 1998 annual report, we said that in 1999 we would:

Implement annual FIA approaches in South Carolina, Georgia, Virginia, Tennessee, Arkansas, Kentucky, Indiana, Iowa, Minnesota, Missouri, and Maine.

Continue final periodic inventories in Arizona, New Mexico, Colorado, Wyoming, Alabama, Louisiana, North Carolina, Tennessee, New Jersey, Delaware, West Virginia, Maryland, Alaska, and Oregon.

Develop and implement a set of core field procedures on all lands.

Continue to make our data and products available online.

Rebuild lost analytical capacity.

Increase research and development in technology, especially in remote sensing.

Continue integrating the plot component of Forest Health Monitoring (FHM) into FIA.

In 1999, we:

Implemented and continued annual FIA in all States listed except Arkansas.

Continued final periodic inventory in all States listed except Louisiana, Arizona, and Colorado. Initiated final periodic inventory in Wyoming, and completed the final periodic fieldwork in the Black Hills of South Dakota.

Developed core field procedures that were implemented in Maine and will be implemented by other units as soon as they complete current projects. Work continues on development of core information management, analysis, and reporting procedures.

Added two online databases to our web site (Resource Planning Act 1997, and the Timber Products Output database). Also added a section containing updates on the status of FIA implementation.

Increased analytical staff from 32.1 to 41.0 full-time positions, and entered into three cooperative agreements with partners to provide analysis of FIA data.

Funded 17 external cooperative studies dealing with technology, of which 16 deal with remote sensing technology in large area forest inventory.

Agreed on a unified program management and budget approach to merging FIA and FHM plots. Agreed to maintain current FHM sample intensity as a subset of FIA plots and to implement FHM plots (now called phase 3 plots) jointly with FIA plots (now called phase 2 plots).

2000 FIA PROGRAM DIRECTION

The FIA program is committed to implementing the Strategic Plan for Forest Inventory and Monitoring, with an initial focus on achieving a base Federal program of 10 percent per year in the West and 15 percent per year in the Eastern U.S. by FY 2003. We have made significant changes to our program by forming a partnership with State Foresters to lead and implement the FIA program in a more responsive manner. We are implementing annual inventory systems in every region of the country.

In fiscal year 2000, we intend to accomplish the following:

- Continue transition to an annual inventory system by continuing annual inventory in all current States and initiating an annual inventory system in Pennsylvania, Wisconsin, Michigan, Arkansas, Louisiana, Utah, and Oregon (fig. 6). This will mean that annual inventory is implemented in every region of the country and will include coverage of over 42 percent of the Nation's forests (exclusive of interior Alaska) under a cooperative program involving full Federal-State partnerships in program management and delivery.
- Continue traditional periodic inventories to establish a baseline in advance of implementing annual inventory in Alabama, Alaska, Colorado, Idaho, North Carolina, Maryland, Washington, West Virginia, and Wyoming.

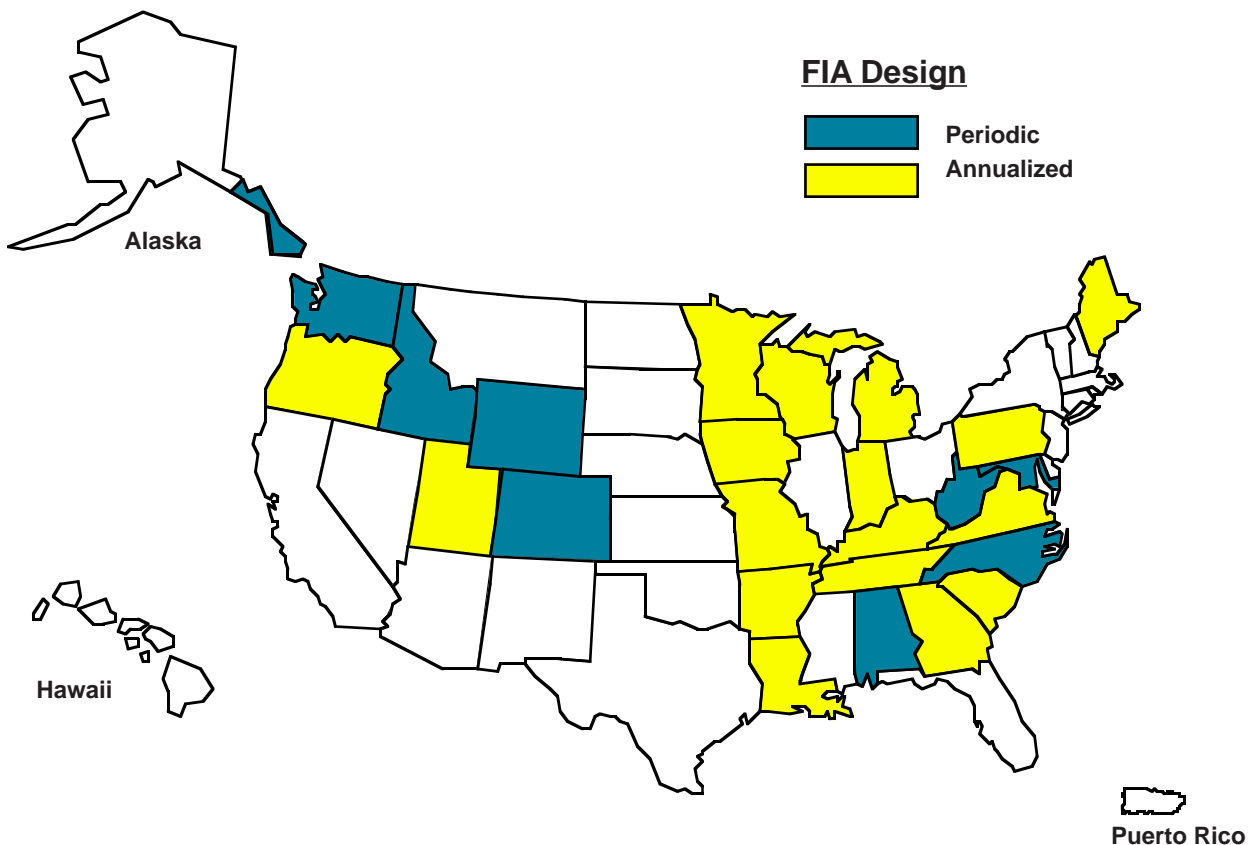


Figure 6.—Planned fieldwork, 2000.

- ❑ Continue development and documentation of nationally consistent compilation, analysis, and database management procedures.
- ❑ Implement phase 2 and phase 3 fieldwork together in those States that are currently conducting annual FIA. Pilot test soil and vegetative measures on some phase 3 plots to prepare for full implementation in 2001.
- ❑ Continue collaborative stewardship of the FIA program by holding user group meetings in all regions of the country and at the national level.
- ❑ Continue to make our data more accessible and usable by adding analytical tools and program documentation to online FIA databases and web pages.
- ❑ Continue to conduct applied research into ways of using technology to increase program efficiency, and to develop new products to meet customer needs. Produce a white paper summarizing experience, lessons learned, and the status of remote sensing in FIA.
- ❑ Sign an internal Memorandum of Understanding between FIA and the National Forest System, to ensure that all national forest lands are in the future covered by the same core FIA program as all other lands.
- ❑ Sign a Memorandum of Understanding between the President of the National Association of State Foresters and the Chief of the Forest Service demonstrating Agency commitment to treat the FIA program as an Agency obligation and to take all allowable steps to ensure that the base Federal program is fully funded by fiscal year 2003.

LONG-TERM STRATEGIC DIRECTION

The Government Performance and Results Act (GPRA) of 1993 directs Federal entities to develop long-term goals and performance measures to monitor progress towards those goals. Although intended to apply at the Agency level, the GPRA framework provides an excellent tool for guiding progress at the project level as well. The following tabulation shows an initial set of goals, performance measures, targets, and benchmarks for the FIA program for 1998-1999. In future annual reports, we will repeat this table to show how we are progressing towards our goals.

Goal	Performance measure	1998 Level	1999 Level	Target Level
INPUTS				
Maintain sufficient funding to support the base Federal FIA program	Percent of necessary Federal funding received	44	47	100
OUTPUTS				
Include 100 percent of U.S. forest lands in the FIA sample population	Percent forest included in the FIA sample population	95	95	100
Keep fieldwork current	Percent of base sample locations visited/year:			
	East	9.0	10.6	15
	West	3.4	3.5	10
Keep analysis current	Average number of years between State analytical reports	11	9	5
Keep online database current	Average age (years) of most recent complete panel of FIA data available online	6	7	1
OUTCOMES				
Customer satisfaction	Percent of customers rating service as “satisfactory” or better.	*	*	100
* Performance measure in development				

CONCLUSIONS

We have entered a new era in partnership and collaboration in which Federal, State, and other colleagues work side by side 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 and analyses as well as elemental data for others to use. And we are 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 window into the business practices of the FIA program, and we encourage you to help us improve the program with your feedback.

APPENDIX

Glossary of Terms Used in Report Tables

Acres inventoried.—Area covered by FIA units in the current year.

Separated into two categories:

Periodic inventory.—Results from States still under the State-by-State inventory program.

Annual inventory.—Results from States implementing annual FIA.

Under each category are shown:

All acres.—All land (forest and nonforest) surveyed this year by FIA. The FIA program covers all lands to monitor the conversion between forest and nonforest, but the bulk of field time is spent on forested plots.

Forest acres.—That portion of “All acres” meeting the definition of forest land and surveyed by the FIA unit this year.

Additional Station funds.—Additional funds redirected to the FIA unit by the Research Station, most commonly from savings arising from budgeted salaries for Station positions that were left unfilled. These funds are typically reallocated part way through the year.

Additional WO R&D funds.—Additional funds allocated to the FIA unit by the Washington Office Research and Development Staff, typically midway through the year or in response to requests for special projects.

Adjustments in FY 99.—Any changes in the 1998 end of year balance made during the 1999 fiscal year. Unlike in private companies, all Federal funds unspent at the end of a fiscal year are subject to reallocation by Agency

officials. Efforts are made to return unspent funds to units, but there is no guarantee that this will occur.

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 “Indirect expenses.” Includes work done for other units as a normal part of FIA business. Includes the following items:

Salary.—Includes direct and indirect salary costs charged to the FIA unit. Broken into the following categories:

Administration.—Program Manager, Project Leader, and clerical staff.

Image analysis.—Airphoto interpreters, satellite image analysts.

Field supervision.—Field crew supervisors who spend <50 percent of time measuring plots.

Field crews.—All staff spending at least 50 percent of time measuring regular plots.

QA crews.—Staff spending at least 50 percent of time doing quality assurance work.

Information management.—Programmers, compilers, computer system support staff.

Analysts.—Staff who analyze data and write publications.

Techniques research.—Mainly research staff who conduct

FIA-related research on methods and techniques.

Travel

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

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

Equipment.—Costs for durable goods used for FIA. Includes the following:

Imagery.—Aerial photos, satellite imagery data files.

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

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

Computer/telecommunications.—Computer hardware, software, communication costs.

Other.—Anything that does not fit into one of the above equipment categories.

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

Publications.—Costs for layout, editing, printing, and distribution of publications.

Miscellaneous.—Anything that does not fit into one of the above categories.

Forest plots per Federal FTE.—Forest Plots Visited divided by the total number of full-time staff employed by the FIA unit—another measure of

the Federal cost of doing business in a given region. Includes analytical, supervisory, and management staff.

Forest plots visited.—Total number of base grid forested plots visited by field crews during the fiscal year.

Indirect expenses.—Indirect expenses include items such as Research Station management salaries, telephones, utilities, and other items for which the FIA unit does not pay for directly but which are deemed by Station leaders to be a fair and reasonable assessment for the basic services needed to support FIA along with other Station activities. Each Station has its own means for determining these assessments. Rather than reporting the different rates, we simply calculate the “Indirect expenses” item by subtraction:

Indirect expenses = Total available resources - Total direct expenses - 1999 end of year balance

Indirect rate.—Indirect Expenses divided by Total Resources Available. 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 resources available to FIA.

NFS funds received.—Funds received from the National Forest System in direct support of the FIA program, generally received from a single Forest Service Region to cover the cost of FIA on that Region’s lands.

1999 beginning balance.—Reported 98 EOY balance plus or minus Adjustments in FY 99.

1999 EOY balance.—Funds remaining unspent at the end of FY99. It is

hoped these funds will be available for use in FY 00. If a unit has overspent its budget, this may be a negative figure indicating a debt to the Station to be paid next year.

1999 initial allocation.—Funds appropriated by Congress through the Forest Service Research and Development budget that were sent to Stations for their FIA units.

Number of user group meetings.—Number of user group meetings sponsored or attended by each FIA unit. A user group meeting is an open meeting where 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.

Other funds received.—Funds received from other sources, such as universities, collection agreements.

Percent forest land in FIA sample.—Percent of forest land in the region where an FIA unit is expected to operate. Equal to 100 percent of land except in regions where national forests do not participate in the FIA program.

Percent forested plots visited.—Forest plots visited divided by the total number of forested plots in the region.

Percent 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.

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

Survey Unit Reports

State Statistical Reports

State Analytical Reports

State Timber Product Output (TPO) Reports

Other Station Publications

Peer-reviewed Journal articles

Proceeding papers

Other.—Publications that do not fit into any of the above categories, such as abstracts, books, or other government publications.

Reported 98 EOY balance.—Funds reported in the 1998 Annual Report as unspent at the end of the 1998 fiscal year, and presumably available for use in FY 99.

State funds received.—Funds received from a State agency in direct support of the FIA program.

S&PF funds received.—Funds received from State & Private Forestry partners in direct support of the FIA program.

Total Federal cost per forest plot.—Total funds expended divided by Forest plots visited, another measure of the cost of doing business in a particular region. This includes any partner funds given to and spent by the FIA unit, but does NOT include any in-kind contributions made by States or other partners.

Total funds expended.—Sum of Direct and Indirect expenses, from table 2.

Table 1.—Performance measures for the 1999 FIA program

	FIA Unit						Total	
	Pacific Northwest	Rocky Mountain	Southern	North Central	North-east	Fort Collins		Washington, DC
Total funds expended	\$4,794,912	\$4,143,614	\$8,797,874	\$3,606,415	\$3,888,468	\$426,081	\$1,567,500	\$27,224,864
Acres inventoried (thousands of acres)								
Periodic Inventory								
All acres	34,024	7,879	14,584	11,911				68,398
Forest acres	3,906	6,940	10,247	5,934				27,027
Annual Inventory								
All acres			151,286	147,015	19,757			318,058
Forest acres			85,075	34,785	17,856			137,716
Forest plots visited	630	1,124	4,733	1,402	1,684			9,573
Percent forest plots visited	2.3	5.0	11.6	8.3	10.4			7.8
Total Federal cost per forest plot	\$7,611	\$3,686	\$1,859	\$2,572	\$2,309			\$2,844
Forest plots per Federal FTE	13.4	21.0	51.9	31.3	30.3			32.3
Publications								
Survey Unit Reports	0	0	3	0	0	0	0	3
State Statistical Reports	0	0	1	0	0	0	0	1
State Analytical Reports	0	1	0	2	0	0	0	3
State TPO Reports	0	0	5	0	5	0	0	10
Other Station publications	3	3	6	3	1	1	0	17
Peer-reviewed journal articles	9	0	6	3	0	6	0	24
Proceedings articles	4	0	5	5	5	1	0	20
Other	3	0	4	4	1	0	1	13
Total	19	4	30	17	12	8	1	91
Number publications per Federal FTE								
Number publications per Federal FTE	0.40	0.07	0.33	0.38	0.22	3.48	0.50	0.31
Percent of forest land in FIA sample								
Percent of forest land in FIA sample	83	100	100	100	100	0	0	95
Percent region covered by annual FIA								
Percent region covered by annual FIA	0	0	37	46	19	0	0	21
Number user group meetings								
Number user group meetings	1	0	6	1	0	0	0	8

Table 2.—Financial statement for the 1999 FIA program

	FIA Unit						Total
	Pacific Northwest	Rocky Mountain	Southern	North Central	North-east	Fort Collins	
I. Available funds							
Reported 98 EOY balance	\$294,000	\$0	(\$85,000)	\$211,927	\$25,000	\$15,000	\$0
Adjustments in FY 99	0	146,000	85,000	4,796	(40,000)	10,781	0
1999 beginning balance	294,000	146,000	0	216,723	(15,000)	25,781	0
1999 initial allocation	3,830,912	2,477,000	8,182,000	3,230,000	3,841,000	400,000	1,836,000
Additional Station funds	0	0	71,240	0	73,200	0	0
Additional WO R&D funds	25,000	50,000	268,634	85,000	50,000	5,000	(268,500)
NFS funds received	910,000	1,653,000	260,000	150,095	0	0	0
S&PF funds received	0	0	16,000	0	0	0	0
State funds received	0	0	0	3,000	0	0	0
Other funds received	0	0	0	26,000	101,000	0	0
Total available funds	\$5,059,912	\$4,326,000	\$8,797,874	\$3,710,818	\$4,050,200	\$430,781	\$1,567,500
II. Direct Expenses							
Salary							
Administration	\$220,000	\$228,217	\$263,400	\$179,015	\$150,820	\$47,692	\$217,602
Image analysis	290,000	0	134,000	238,594	190,000	0	0
Field supervision	317,000	279,004	607,500	165,906	248,627	0	0
Field crews	500,000	981,615	961,500	544,751	628,931	0	0
QA crews	123,000	141,594	403,000	43,887	169,000	0	0
Information management	521,723	425,451	846,100	370,872	333,210	0	0
Analysis	368,000	259,621	1,070,500	362,596	345,775	0	0
Techniques research	189,000	0	384,000	291,867	243,769	140,348	0
Travel							
Office travel	89,000	43,295	272,400	53,559	82,555	32,047	30,590
Field/QA crew travel	190,354	234,484	735,000	188,592	220,992	0	0
Equipment							
Imagery	47,000	0	18,000	22,594	11,000	0	0
Vehicles	593,000	143,849	174,000	96,841	86,000	225	0
Field equipment	48,000	117,666	102,000	49,758	186,000	0	0
Computer/telecom-							
communications	104,943	315,942	271,000	282,538	201,000	10,991	532
Other	93,000	231,257	12,000	3,888	82,500	146	3,079
Grants & agreements	399,000	112,420	1,462,921	58,500	27,716	137,592	88,000
Publications (printing, distribution)	4,000	0	1,000	3,095	0	2,154	1,725
Miscellaneous	50,000	0	100,825	0	4,200	2,201	2,280
Total direct expenses	\$4,147,020	\$3,514,415	\$7,819,146	\$2,956,853	\$3,212,095	\$373,396	\$343,808
III. Indirect expenses							
(indirect rate, percent)	\$647,892	\$629,199	\$978,728	\$649,562	\$676,373	\$52,685	\$1,223,692
	13	15	11	18	17	12	78
IV. 1999 EOY balance							
	\$265,000	\$182,386	\$0	\$104,403	\$161,732	\$4,700	\$0
							\$718,221

Table 3.—Staffing (full-time positions) for the 1999 FIA program

	Pacific Northwest	Rocky Mountain	Southern	North Central	North-east	Fort Collins	Washington, DC	Total
Administration	5.0	5.3	5.0	3.4	5.5	0.5	2.0	26.7
Image analysis	4.0	0.0	6.0	6.0	3.8	0.0	0.0	19.8
Field supervision	4.0	4.8	7.3	2.6	5.3	0.0	0.0	24.0
Field crews	14.0	27.5	26.6	16.2	25.3	0.0	0.0	109.6
QA crews	3.0	3.7	9.1	0.8	3.0	0.0	0.0	19.6
Information management	9.0	7.5	14.2	6.4	4.5	0.0	0.0	41.6
Analysis	6.0	4.8	20.0	5.7	4.5	0.0	0.0	41.0
Techniques research	2.0	0.0	3.0	3.8	3.8	1.8	0.0	14.3
Total	47.0	53.6	91.2	44.8	55.6	2.3	2.0	296.5

Table 4.—Grants and agreements entered into by FIA units, FY 1999

Amount	Partner and purpose of work
I. Remote sensing related:	
\$48,000	Oregon State University, study of LIDAR remote sensing technology to evaluate the effectiveness in assessing canopy layers
\$128,000	Leeds University, London, United Kingdom, study of the application of Neural Networking to combine remote sensing data and field plot data to predict the extent and distribution of overstory species in Alaska
\$16,000	University of Minnesota, stratification of annual inventory samples for variance reduction using k-Nearest Neighbor techniques and single-season satellite imagery
\$37,500	Minnesota Department of Natural Resources, study of the use of satellite imagery for constructing and updating forest/nonforest masks and cover type maps with change detection techniques
\$85,000	Minnesota Department of Natural Resources, study of geospatial and remote sensing methods that integrate FIA data with information survey data from the National Resources Inventory conducted by the Natural Resources Conservation Service
\$30,000	National Center for Air and Stream Improvement (NCASI), co-sponsorship of a competition for ideas to improve use of remote sensing technology in conducting large-scale forest inventory
\$38,000	Forest Service, Remote Sensing Applications Center (RSAC), survey of training needs for FIA staff and development of a training curriculum for increasing use of remote sensing applications
\$13,443	Mississippi State University, digitized forestry images and models for monitoring psychological, silvicultural, and wildlife habitat attributes
\$189,421	Mississippi State University, remote sensing applications for annual forest inventory
\$8,400	Virginia Polytechnic Institute, remote sensing work for followup on FY 98 NCASI grant to Southern Research Station
\$21,600	NCASI, forest area and type estimations using satellite data

(table continued on next page)

(table 4 continued)

Amount	Partner and Purpose of Work
\$40,000	Forest Service, Southern Station Unit 4702, digital camera estimation techniques
\$23,200	Forest Service, Southern Station Unit 4104, development of volume equations
\$5,000	University of Maine, classification of Landsat Imagery
\$7,000	Institute of Ecological Studies, spatial analysis of FIA data
\$45,000	Utah State University, development of spatial products from FIA data
\$735,564	TOTAL

II. Other: collecting, analyzing, reporting, and distributing FIA information

\$10,326	Mississippi State University, development and maintenance of Starkville Forestry Sciences Lab Arboretum
\$1,126,531	Cooperative agreements with the States of Alabama, Arkansas, Georgia, Kentucky, South Carolina, Tennessee, and Virginia for conducting fieldwork in support of annual FIA
\$138,000	University of Montana, TPO studies in Oregon and California over the next 3 years
\$85,000	Oregon Department of Forestry, problem analysis for riparian issues relating to vegetation
\$5,000	Purdue University, study of the use of off-grid Forest Health Monitoring plots to address forest health issues in Indiana State Parks
\$29,592	Colorado State University, Statistics Department, building of a simulation database for the Aspen-Birch Unit of Minnesota, and comparison of estimation alternatives for annual FIA data
\$21,000	Colorado State University, Statistics Department, study of small-area estimation methods that use FIA data
\$21,840	University of Montana, Arizona logging utilization study
\$45,580	University of Montana, Montana's forest products study
\$50,000	University of Nevada-Las Vegas, assistance and support with information management technology and applications
\$15,716	Institute of Ecological Studies, in support of the Delaware River Basin Assessment
\$2,000	Environmental Protection Agency, consultation on merging FIA and FHM data collection activities
\$1,550,585	TOTAL

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

Northeast

Program Manager, FIA
USDA Forest Service
Northeastern Research Station
11 Campus Boulevard, Suite 200
Newtown Square, PA 19073
(610) 557-4075

South

Program Manager, FIA
USDA Forest Service
Southern Research Station
200 Weaver Boulevard
Asheville, NC 28802
(828) 257-4309

Pacific Northwest

(includes Alaska and Hawaii)

Program Manager, FIA
USDA Forest Service
Pacific Northwest Research Station
1221 SW Yamhill Street, Suite 200
Portland, OR 97205
(503) 808-2066

National

Forest Inventory National Program Leader
USDA Forest Service 1NW
201 14th Street SW
Washington, DC 20090-6090
(202) 205-1507

North Central

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

Rocky Mountain

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

Statistical Techniques

Project Leader, FIA
USDA Forest Service
Rocky Mountain Research Station
2150 Centre Avenue, Bldg. A, Suite 350
Fort Collins, CO 80526-1891
(970) 295-5973

All of our regional Internet homepages, as well as a wealth of statistical and other information, are available through the national FIA homepage located at:

www.srsfia.usfs.msstate.edu/wo/wofia.htm