

United States
Department of
Agriculture

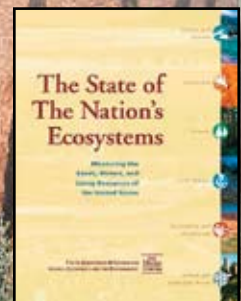
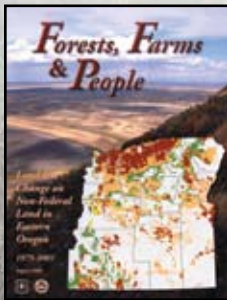
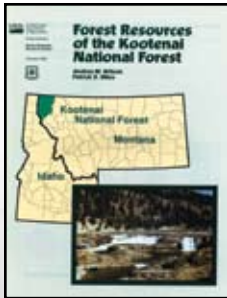
Forest Service

FS-865

January 2007

Forest Inventory and Analysis Strategic Plan

**A HISTORY OF SUCCESS
A DYNAMIC FUTURE**





A MESSAGE FROM THE CHIEF

For more than 75 years, the Forest Inventory and Analysis (FIA) program has been a flagship research program of the U.S. Department of Agriculture (USDA) Forest Service, reporting on the status, condition, and trends of the Nation's forests.

In 1999, Congress directed the USDA Forest Service to reevaluate its statewide inventory mission and to make the transition from a periodic survey approach by State to one in which each State is inventoried annually. FIA moved forward, in concert with its partners, to develop a 5-year strategic plan to carry out the new congressional mandate. Congress approved the first strategic plan and provided funding to move FIA toward full implementation of annualized inventory throughout the country. Published Annual Business Reports have informed Congress, partners, and the public of FIA's progress toward this goal each year (<http://www.fia.fs.fed.us/library/bus-org-documents/default.asp>).

With the goals of the first plan nearly completed, a new plan has been drafted. This new plan, presented on the following pages, lays out a dynamic future for FIA that openly embraces new methods and technology and increased support from the States (FIA's primary partners) and other public agencies, universities, nongovernmental organizations, and interested parties.

We face new challenges each day—urban sprawl and fire risk at the wildland-urban interface, the effect of forest fragmentation on habitat, invasive threats to our native vegetation, and soil and water quality related to forest management, just to name a few. The program outlined in this plan is designed to provide data and analysis related to these and other important issues vital to monitoring the ability of America's forest ecosystems to provide value-added goods and services to the public in a sustainable fashion.

I urge you to study this plan carefully, get involved, and join me in actively supporting a new century of service from FIA.

A handwritten signature in black ink that reads "Dale N. Bosworth". The signature is fluid and cursive.

Dale Bosworth
Chief

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INTRODUCTION

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 for developing effective management scenarios. It has helped guide industrial expansion into the most suitable and opportune locations, acted as watchdog for identifying problems emerging in the timber supply, provided key forest resource information for planners and policymakers, and provided expert advice and assistance in solving complex resource questions. It has been internally motivated to improve the reliability and usefulness of forest resource statistics and the analysis of resource findings. 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.

High standards set in its early days and maintained over the years by FIA have established a tradition of full, unbiased, and factual presentation of forest resource information. These same high standards must be sustained in the future if FIA is to retain its credibility and usefulness. Therefore, all change, expansion, or shifts in program emphasis must be made with utmost care to ensure that all information produced is based on adequately tested procedures and sound research.

With this background in mind, the FIA program, known as the Nation's Forest Census, proposes a new and broader program for the future. This plan updates the previous FIA Strategic Plan prepared in 1999 (USDA Forest Service). A summary of program statistics and performance measures for the first 7 years of the Annualized Inventory program is provided in the appendix of this plan.

MANDATE

The FIA program, initially known as the Forest Survey, was conceived in 1928 when the U.S. Congress acknowledged the need for information about the supply and condition of the Nation's natural resources. The Organic Act of 1897 (16 U.S.C. §473), which established the national forests, included provisions for the inventory and management of these lands. Later, the Forestry Research Act (McSweeney/McNary) of 1928 directed the Secretary of Agriculture to make and keep current a comprehensive inventory and analysis of the Nation's forest resources. The Resources Planning Act (RPA) of 1974 (16 U.S.C. §1601) amended the



earlier research act and directed the Secretary of Agriculture to “make and keep current a comprehensive inventory and analysis of the present and prospective conditions of and requirements for the renewable resources of the forest and rangelands of the United States.” The Forest and Rangeland Renewable Resources Research Act of 1978 (16 U.S.C. §1641), which replaced the earlier forestry research legislation, repeated the amendment contained in the RPA.

Recent legislation further instructed the FIA program to establish an enhanced program to inventory and analyze, in a timely manner, public and private forests and their resources in the United States, including (1) an annual inventory of each State every year; (2) a 5-year report for each State; (3) national standards and definitions for reporting; (4) provisions to ensure protection of private property rights; and (5) a process for employing remote sensing, global positioning systems, and other advanced technologies.

DRIVERS OF CHANGE

The development of FIA’s mission and vision has been guided by several long- and short-term issues that were outlined in the document, “A Blueprint for Forest Inventory and Analysis Research and Vision for the Future,” written by FIA leaders (USDA Forest Service 1993) following the first Blue Ribbon Panel on FIA in 1991 (AFC 1992). These issues are still valid today.

Long-Term Issues

These four issues related to renewable natural resources will directly affect the FIA program:

- 1. Increasing pollution.** This issue includes such topics as air pollution, the effects of global climate change, deterioration of forest health, and changes in forest productivity.
- 2. Dwindling resources.** This issue encompasses lack of regeneration, overharvesting, desertification, a loss of biological diversity, dwindling old-growth forests, and forest ownership fragmentation and tenure change.
- 3. Increasing population.** This issue is closely linked to urbanization, land clearing, and increased pressure on remaining forest systems to supply necessary goods and services.
- 4. Proliferation of information.** This issue includes the continual need for accurate, timely resource information and easy access to data.

Short-Term Issues

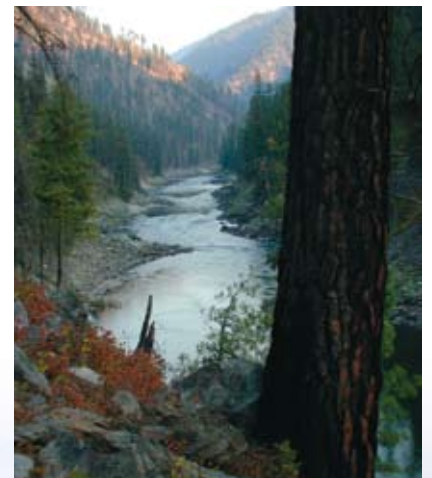
By being aware of upcoming trends, the FIA program can anticipate research needs rather than react to crises. The following three major trends will affect forest resources:

- 1. A changing forest land base.** The ability of our forests to supply forest products is declining in response to growing pressures to supply a broad spectrum of commodities and nonmarket goods and services. To keep pace with dynamic land use and land cover change, the complete inventory reema-

surement cycle should be short and appropriate variables should be collected to adequately characterize other resources values.

- 2. Rising noncommodity uses.** The extent and condition of forest resources, on which noncommodity uses depend, need to be thoroughly documented. In-depth analyses are needed to estimate outdoor recreation demand and potential increases in use, wildlife habitat suitability and extent, watershed conditions, grazing use, and biological diversity. To get a complete picture of these resources, all forest land, including wilderness areas and parks, should be included in forest resource inventories and featured in reports.

- 3. Environmental health change.** Forest health and productivity are affected by a large number of interacting factors. Air quality problems and the potential for anthropogenic climate change have increased the need for timely information on the health and productivity of the Nation’s forests. Addressing these issues requires efforts from many disciplines to provide new kinds of monitoring data. A key role will be the establishment of a baseline that can be monitored to detect changes in the health and risks affecting major forest ecosystems over time.



MISSION

FIA's overall mission is to improve the understanding and management of our Nation's forests by maintaining a comprehensive inventory of the status and trends of the country's diverse forest ecosystems, the use of the forests, and the health of these ecosystems.



Since 1930, the FIA program has collected, analyzed, and reported information on the status and trends of America's forests. FIA tracks how much forest exists, where it exists, who owns it, how it is being managed, and how it is changing, as well as how the trees and other forest vegetation are growing and how much has died or been removed.

This information is used in many ways, such as evaluating wildlife habitat conditions, assessing the sustainability of ecosystem management practices, and supporting planning and decisionmaking activities undertaken by public and private enterprises.

VISION

The FIA program is designed to deliver current, consistent, and credible information about the status, condition, and trends of America's forests. FIA researchers collect data and summarize it for all States each year reporting the most current information, which is recognized as the single best source of indicators of the sustainable management of America's forests. FIA uses the latest technologies to acquire data through remote sensing, field activities, primary forest product studies, utilization studies, and landowner surveys. FIA collaborates with other Federal and State agencies and experts from universities and else-

where to augment research and analytical capabilities and to help develop new inventory and monitoring techniques. Rigorous quality assurance procedures verify the accuracy of our estimates and validate our analytical results.

The vision of FIA was perhaps best articulated in a Government Accountability Office report (GAO 2004) concerning the status of Federal data programs that support ecological indicators. The report stated that FIA is able to provide some of the most complete data available on a timely basis, an accomplishment made possible by the integration of remote-sensing data and field-based data into a new forest monitoring technique that makes possible an annualized inventory cycle in every State. The report adds that FIA is using new technologies to develop maps showing information on forest types, biomass, fuel loading, and fire risk.

Major elements of the FIA vision are guided by a defined Base Federal Program approved by Congress in 1999 that envisioned the FIA program as a partnership between the U.S. Department of Agriculture (USDA) Forest Service and State organizations and other resource agencies. The FIA annual inventory program is implemented in 46 States, including coastal Alaska, and 7 of 9 Pacific and Caribbean Island groups (*figure. 1*).

STRATEGIC GOALS

In the course of moving from periodic to annual inventories, FIA managers consulted with numerous partners and clients to determine the respective responsibilities and expectations of the different parties. Those expectations led to the definition of a

Base Federal Program, which described the level of service the USDA Forest Service would provide to all States and territories, regardless of their ability or willingness to collaborate. The Base Federal Program consists of the following elements:

- A three-phase program including remote sensing for stratification (phase 1), a sample of ground plots measured for basic forest data (phase 2), and a subsample of the phase 2 sample plots measured for an extended suite of ecosystem attributes (phase 3).
- Work with principal partners to enhance the timeliness and quality of the program.
- A National Woodland Owner Survey (NWOS) to increase our understanding of private woodland owners.
- A survey of primary forest products output within each State.
- Development of a consistent core set of field measurements collected the same way across all U.S. forested lands.
- Annual data collection on 10 percent of all phase 2 plots in the Western United States, 15 percent of all phase 2 plots in the Eastern United States, and a subsample of one-sixteenth of the phase 2 network for phase 3 plots.
- Compilation of all field data on an annual basis, made available on-line within 6 months of the end of the data collection for the panel.
- Comprehensive, analytical reports at 5-year intervals for each State.
- Special designs for interior Alaska, the Caribbean and Pacific Islands.

To achieve these strategic goals, including a core set of nationally consistent

procedures, continuously updated databases available on the Web, and 5-year analytical reports, many managerial and technical tasks need to be completed:

- Make National Information Management System (NIMS) fully operational.
- Develop and enhance Web-based tools for accessing and analyzing FIA data.
- Complete State-level analytical reports for all lands every 5 years.
- Develop and implement algorithms for estimating change over time under the annual inventory approach.

Working with our partners, FIA managers have established support technical groups called “bands” in major thematic areas. The bands are composed of both FIA and partner professionals who review and evaluate alternative strategies to resolve problems and make recommendations that support efficient solutions. The following sections present some of the more specific goals and priorities for these thematic areas.

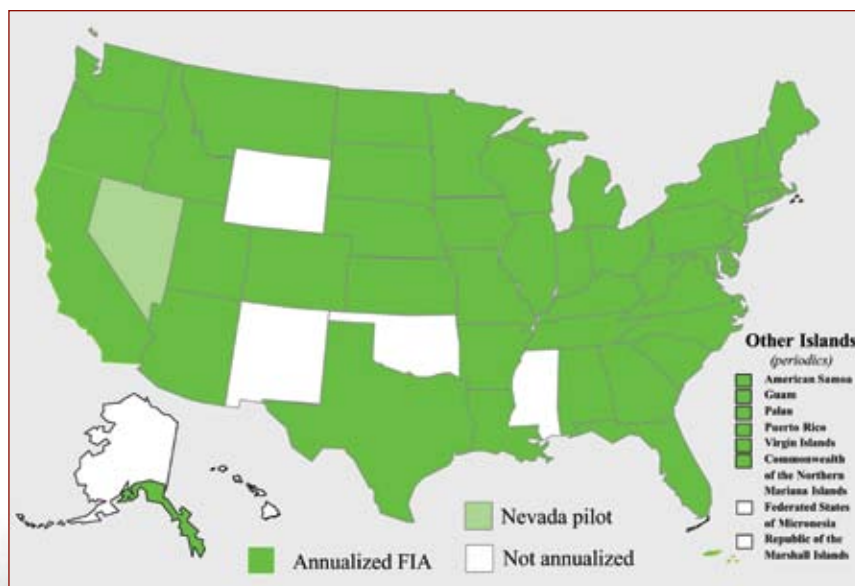


Figure 1.—Status of annualized inventory as of fiscal year 2006.



Statistics and Design Band. This band develops, tests, and documents sampling and estimation methods. These professionals routinely study fieldwork as part of a cost/benefit analysis to identify ways to improve efficiency and effectiveness, and they develop small-area estimation methods to both improve estimates for small populations and to spatially distribute the plot-based sample estimates.

Analysis Band. This band produces the 5-year report template and compares core table requirements with the core manual variables for consistency. This work group will review the implementation of the NWOS, develop options for integrating remote sensing products that add value, and provide a focal point for the addition of new attributes and indicators.

Indicators. This analysis band subgroup develops stable phase 3 indicators in terms of fieldwork timing and protocols, information management, analysis, and reporting. This work group assists with the integration of indicators by developing standard national and regional tables, maps, reports and documentation of sampling and estimation methods for each indicator.

Remote Sensing Band. This band develops the use of consistent satellite imagery to stratify the primary sample to produce area estimates and identify attributes that can be measured with similar accuracy from remote-sensing/ Geographic Information System (GIS) methods. These professionals also develop methods to efficiently automate those measurements and develop a strategy for operational remote sens-

ing and geospatial modeling and for linking satellite imagery and derived products to spatial data in the FIA database to enable a wider variety of spatial analyses and products.

Information Management and Compilation Band. This band is divided into three major subgroups:

1. Portable Data Recorder (PDR) Team. This team develops PDR software to meet core national needs and full-featured software to meet the diverse needs of the regional FIA units.

2. Development Team. This team develops and implements a strategy for NIMS to accommodate the operational use of remote sensing. The team also develops data distribution strategies to accommodate any derived or core-optional variables needed to generate core products. Team members ensure that landowner and timber products databases are placed on an annualized system.

3. Data Distribution Team. This team develops the next generation of FIA data distribution tools, incorporating the full suite of data from remote sensing, field studies, and special studies and ensuring the processing, storage, and delivery of this data by NIMS.

Data Acquisition Band. This band maintains documentation for a nationally consistent core field procedure through National Field Manuals (<http://fia.fs.fed.us/library/field-guides-methods-proc/>). This work group develops and implements comprehensive training and quality control programs and continuously reviews field techniques and measurements to develop cost-effective alternatives for improving data-gathering efficiencies.

PROGRAM FOCUS

The FIA program will maintain historical excellence in collecting, analyzing, and reporting on data related to the extent, productivity, location, and status of U.S. forest lands and on data from landowner surveys and primary forest product studies. FIA will also continue to broaden the scope of the program to include sets of measurements pertaining to tree vigor and health, vascular plant species diversity and abundance, soil conditions, down woody debris, and other critical measures of ecosystem health or risk. The FIA database will maintain a full suite of the most recent data for all States.

Much of the success of the FIA program rests on several key elements of program focus.

National Core Variables. The FIA program will continuously review core variables—including the NWOS, which contains national core variables about ownership, management objectives, demographics of the private woodland owners, landowner perceptions of forest health, and flows of market and nonmarket goods—for consistency and application as part of the base FIA program. Primary forest product studies contain core information about timber harvest and uses.

Consistency. The FIA program will maintain written guidelines documenting data collection, estimation, and reporting methods to ensure consistency. FIA will also maintain NIMS for managing all field-sampled data and support a Web-based data compilation and analysis engine to enable users to access data and produce results in a consistent manner across the country, including support of regional data to meet the needs of partners and customers.

Information Availability. The FIA database (FIADB) contains a full suite of the most recent data for all States. FIA information is also loaded into the National Forest System's Natural Resource Information System (NRIS) to make data readily available to national forest managers. FIA will continue to focus on loading each year's phase 2 data within 6 months of the end of the field season and phase 3 data within 12 months as posted in the *Federal Register* (FR 2005). At the end of fiscal year (FY) 2005, information less than 2 years old was available in an online FIA database (<http://www.fia.fs.fed.us/tools-data/data/>) for 42 States. Ownership survey and primary forest product information will also be added to the full suite of online data.

New Technology. Integrating new technologies is critical to the efficient delivery of the FIA program. FIA has teamed up with the U.S. Geological Survey to improve the accuracy of mapping forest cover under the 2001 National Land Cover Dataset project. Other potential technology partnerships include the National Resources Conservation Service's National Resources Inventory, the Multi-Resolution Land Characterization Consortium (MRLC) and its National Land Cover Data (NLCD) products, GAP Analysis Program (GAP), the National Aeronautics and Space Administration (NASA), and the National Oceanic and Atmospheric Administration (NOAA). Most opportunities for technology development involve sharing cost and logistical burdens to more efficiently and effectively use remotely sensed data from satellites and low-altitude aircraft to facilitate broad-scale applications of GIS techniques to improve geospatial analyses. FIA has a preeminent position in all Federal efforts to inventory and monitor forest resource conditions at the regional and national levels and



in innovative uses of remotely sensed data to improve the number of products, the quality and timeliness of those products, and the cost-effectiveness of the FIA program.

Partnerships. The FIA program is based on partnerships. Within the USDA Forest Service, the FIA program exists as a partnership among three branches: Research and Development (R&D), which provides the overall leadership and management of the FIA program; National Forest System (NFS); and State and Private Forestry (S&PF). All USDA Forest Service partners actively participate in program management. In addition to depending on internal partners, FIA relies heavily on a variety of external partners to increase the efficiency and quality of the program.

State forestry agencies are key principal partners in many States, taking an active role in data collection, analysis, and facilitating contacts with landowners. Universities provide technical assistance in data analysis and reporting and in research aimed at improving FIA program operations. The National Association of State Foresters (NASF) is committed to seeking the funding necessary for implementing the Base Federal Program. The success of FIA partnerships is evident through the 10 to 20 percent annual contributions to total program funding provided by partners (figure 2).

FIA has also worked closely with NatureServe to develop the National Vegetation Classification System to provide Federal Geographic Data Committee-compliant classification of field data. FIA works with the

Conservation Biology Institute (<http://www.consbio.org>) to develop reliable spatial files and maps of protected areas and public lands.

Accountability. Each year the FIA program publishes a business report that describes basic information about the annual activities of FIA: current year's accomplishments, performance measures, budget and staffing data, program changes, and planned accomplishments for the upcoming year. This report is distributed to all interested customers and partners, and made available on the FIA Web site at <http://fia.fs.fed.us>.

ORGANIZATION

FIA relies on a strong and vibrant organization of professionals dedicated to delivering an effective program with a clear track record of accountability. Several important elements are the cornerstone of FIA success.

Organizational Structure. The FIA program has developed a "virtual" organization structure designed to provide opportunities for collaborative decisionmaking among program partners, while respecting the decentralized nature of formal USDA Forest Service organizational structures.

The national structure consists of the following three levels:

1. The executive level (figure 3) is composed of three State foresters, four research station directors, two NFS regional foresters, and one national director from each R&D, NFS, and S&PF Deputy Area. The R&D

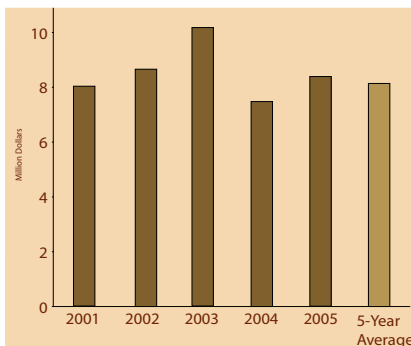


Figure 2.—State contributions to support the FIA program, 2001–05

Science Policy, Planning, Inventory, and Information deputy director serves as chair, and the members of this level meet annually to provide policy guidance.

2. The management level is composed of four FIA regional program managers, the FIA national program leader and associate, a national representative from Forest Health Monitoring, a national representative from NFS, and three State representatives. The FIA national program leader chairs this team, which meets bimonthly to make decisions about operational program elements with national implications.
3. A technical level composed of five technical groups (statistics, analysis, remote sensing, information management, and data acquisition) meets as needed to develop technical solutions and to share expertise across all program units.

Operational implementation of the FIA program occurs through four FIA research work units regionally assigned to the Southern, Northern, Rocky Mountain, and Pacific Northwest Research Stations. At the regional level, regional management teams provide opportunities for communication and coordination within each FIA region. This structure is complemented by a system of regional and national users groups that meet every year to provide feedback on program success.

Distribution of National Roles to the Regional Units. The 1999 Strategic Plan assumed that a nominal level of national staff would provide support for national functions. In practice, FIA has found it more practical to locate

these resources wherever possible within field FIA units. Each FIA field unit has offered to accept one or more national functions. Currently, the FIA program contains six major national activities: (1) FIADB including timber products output (TPO), (2) NIMS, (3) the NWOS, (4) NRIS with NFS, (5) the National Assessment and RPA database, and (6) National Indicator Advisors. These commitments are supported by inter-unit transfers of funds that provide flexibility and ability to adjust commitments annually.

Efficient Staffing. In 1999, FIA made many assumptions about the quantity and types of skills needed to implement the Base Federal Program. Since that time, each FIA unit has reassessed its needs and developed updated staffing plans based on the best current understanding of needs and on an assessment of opportunities for using State and Federal partnerships throughout the program. Annually, between 10 and 20 percent of the FIA program is delivered through partnerships.

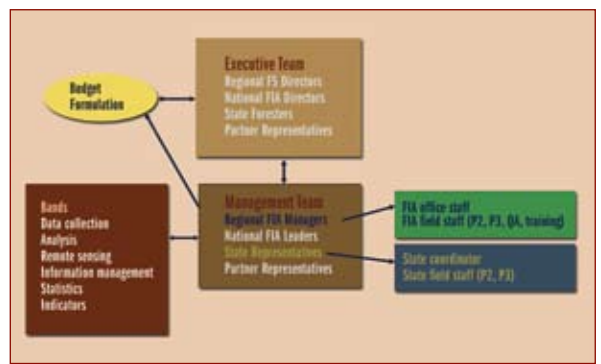
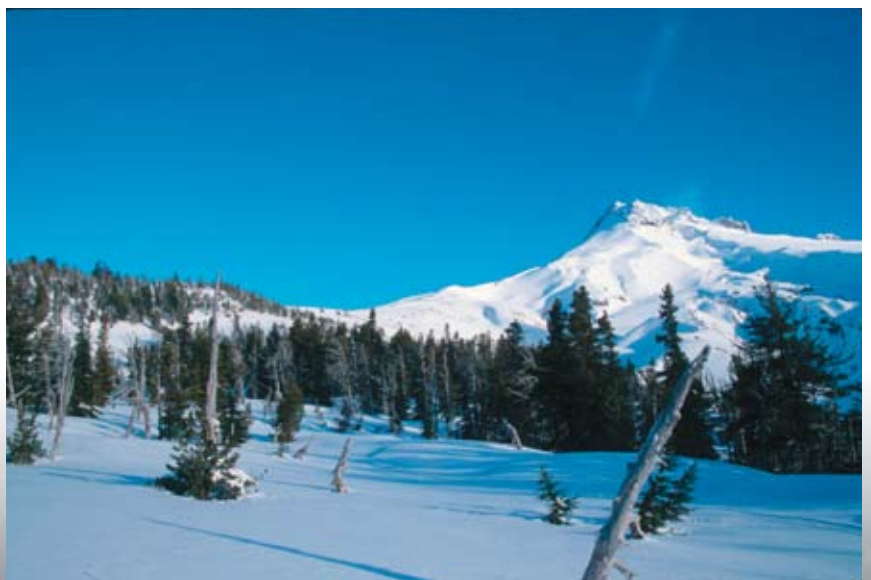


Figure 3.—FIA management structure overview.



EMPHASIS SHIFTS

After the first 7 years, FIA has 46 States (including coastal Alaska) with active annualized inventory operations. From this experience, partners and clients have commented on areas of the program that need more emphasis and other areas in which some think FIA should expand its scope and head in new directions. This section will look at a series of emphasis shifts or operational changes that, by saving money or being inexpensive, will be relatively cost neutral to the program as a package.



Synchronized Phase 2 and Phase 3 Plot Schedules. FIA units are increasing their overall program efficiency by synchronizing phase 2 and phase 3 plot measurement schedules. Currently, all phase 3 plots are on a 5-year measurement schedule. For States that are currently measuring 20 percent of the phase 2 plots per year, program efficiencies for plot visits, data processing, and estimation have been achieved. States on a 10-year (10 percent a year) or 7-year (15 percent a year) cycle still suffer from a number of inefficiencies. These obstacles include visiting 1/16th of the plots at time intervals different than the remaining portion of the plot network, thus increasing costs and complexity throughout the program. Synchronization could generate roughly \$500,000 annually to offset other emphasis shifts.

Improved Techniques Research. FIA is increasing capacity to conduct techniques research to improve how data are collected, analyzed, and disseminated. Potential research areas include improved sampling and estimation procedures, better linkages to small-area or tactical assessments, improved

geospatial analytical tool development, and better mechanisms for making data and results available to the public. FIA has long supported a modest investment in in-house and external research of techniques. An emphasis on national techniques will increase FIA involvement in internally directed extramural research that will increase the knowledge and uses of FIA data.

Increased Analytical Capability.

Although FIA currently invests approximately 20 percent of its budget in compiling and analyzing information, clearly more could be done to increase the quantity of high-quality analysis. Such an investment will yield specialized reports related to carbon sequestration, forest health, wildlife habitat, customer-specific analyses, and more spatial analyses and map products. This work will be accomplished through a combination of in-house analysts and cooperative agreements or contracts with universities, States, and other qualified analysts. The goal is to achieve this increased capacity through efficiencies in other areas of the program.

Increased Use of Remote Sensing and Spatial Techniques.

The FIA program recognizes that significant efficiencies could be realized by using high-resolution imagery, including light detection and ranging (LIDAR) technology in the interior West, interior Alaska, and other regions with forests dominated by open canopies and lower levels of stocking. Because resource issues in these regions are often different than for highly productive forests, FIA is currently developing procedures that will be less reliant on one ground plot per 6,000 acres. FIA anticipates significant gains in efficiencies for these regions.

Improved Land Use/Land Cover Change Analysis.

FIA data (both remotely sensed and ground data) will be used to perform analyses and produce reports about status, trends, and location by land use class. This analysis will include assessments of land use and land cover change and fragmentation, as well as the development and support of users tools that enable others to do such analyses. FIA data represent a huge investment in spatial data collection, yet program analyses have not fully exploited the potential set of land use/land cover change analyses that may be conducted. FIA field data, in particular, represent a very large asset for ground-truthing remotely sensed imagery. Many analysts are currently producing assessments of land use and land cover change, without access to sufficient ground data—hence, the increased demand for access to FIA coordinates. Creating some increased capacity in-house for spatial analyses of FIA data will lead to more and better products for society. Although land use/land cover change relative to forest and nonforest will be part of the cost-neutral emphasis shifts, a full suite of measures for all land uses and covers will require additional funding.

FUNDING

To achieve the desired goal of full implementation, FIA needs to be funded at a level of at least \$73,371,000 in FY 2007 and beyond. The program will then find internal efficiencies to maintain capabilities in all 50 States for the next 5 years for the basic mission outlined in this plan. A funding history/projection for 1999–2012 is shown in figure 4 (the annual funding gap is represented by the white section of the graph bars).

NEW DIRECTIONS

Although the primary focus of the FIA program will remain on delivering the national annual forest inventory, FIA is frequently asked to expand its scope by applying expertise in forest inventory and analysis to enhance the program.

FIA is changing and, as new partners engage, it is critical that FIA not lose its mission and place with current partners. FIA does not plan to implement new or expanded surveys on all lands without proper resource and partner support. FIA recognizes that timely, high-quality data and analyses are paramount in addressing forest industry, State, Federal, and private forest land issues and needs. The changes outlined and requested from the first and second Blue Ribbon Panels (AFC 1992, AFPA 1998) on FIA are being realized. The recent success of implementing annual surveys through State and Federal partnerships is leading to enhanced and new partnerships. FIA is ideally positioned to work collaboratively with these partners in realizing their needs.

The following sections outline a series of possible emphasis shifts, enhancements, or additions to the FIA program. Some are low cost while others would require significant resources to implement. The development and implementation of these opportunities are not included in FIA current or target funding (figure 2).

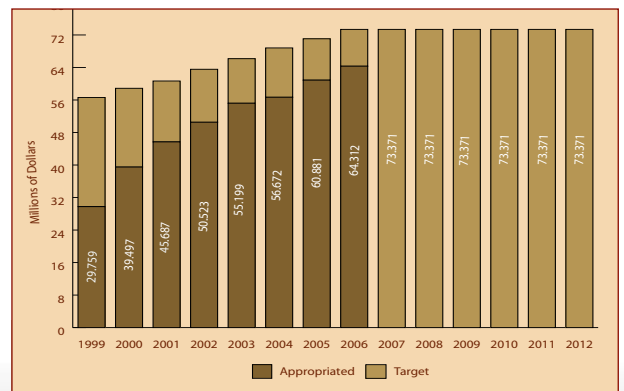


Figure 4.—Appropriated Federal funds and target funding for the annualized FIA program.

More Aggressive Remote-Sensing Approaches. Many partners noted that, although the current program resources are focused mainly on field visits for data collection, future activities may include a much larger proportion of FIA data being collected via various remote-sensing activities. These activities will not eliminate field visits but will potentially reduce the number of field visits for data collection. As remote-sensing platforms become more sophisticated, field verification data will have to keep pace. Thus, while field visits may decline, the data collected will need to be more timely and tuned to remote-sensing verification. These opportunities are perhaps most apparent when considering the inventory of interior Alaska where field access is extremely difficult.



Enhanced NFS Support. NFS has suggested that the USDA Forest Service consider FIA as the most viable program to implement a general strategic vegetation inventory on all NFS lands, not just those that meet the definition of forest. To meet this need, FIA must be implemented annually in all States and the sample design must be directly tiered to the FIA phase 2 grid. A full suite of standard vegetation (grasses, forbs, shrubs, and trees) sampling protocols would be implemented across all NFS lands, not just forested lands. Other known needs include the ability to intensify the base Federal grid beyond a 2X intensification if needed and develop an “a la carte protocol” for a suite of additional attributes that would meet NFS information and business needs. This expansion would also require an inventory compilation package developed for NFS business needs, including mid-level vegetation map products.

Rapid Assessment Teams. FIA could create and maintain staff trained in rapid assessment techniques to provide emergency resource assessments in the aftermath of an environmental disturbance (e.g., a fire, storm, hurricane, or sudden insect or disease outbreak). The team could have expertise in data collection as well as information management, compilation, analysis, and reporting. It could be maintained on call for use as needed for rapid deployment in days or weeks following a disturbance.

Family Forest Research Center. The goal of the Family Forest Research Center (FFRC) will be to promote sustainable forest stewardship through increased understanding of family forest owners. The FFRC will be a collaborative venture between FIA and researchers from academia, nonprofit organizations, corporations, and other USDA Forest Service research units. The FFRC will be the epicenter for implementing and analyzing FIA’s NWOS. In addition to implementing the NWOS, the FFRC will have the capacity to implement other forest landowner research on a competitive basis (e.g., receiving grants or contracts from other groups). A collaborative approach will increase analytical capacity, reduce costs, and increase efficiency.

Urban Forest Inventory. A systematic approach to collecting and reporting data on status and trends of trees and forests in urban settings could be implemented. The FIA system currently does not include urban forests—lands classified as urban are excluded from the FIA population of interest, regardless of whether the land has trees. The FIA sample frame could

be expanded to urban settings, maintaining the strategic scale while providing a platform for others to intensify to the individual city level. Urban trees and forests play a huge role in quality of life of urban populations, which includes some 80 percent of the U.S. population. Urban populations have a need for and an interest in information about the state of trees and forests in their surroundings. Urban trees have significant implications on urban energy budgets and air quality and would also be of high interest to island environments. This issue is of high interest to States with an increasingly urban population.

For example, the NASF has convened a task force representing the USDA Forest Service, the NASE, State urban forestry coordinators, and forest health specialists to perform the following tasks:

- Evaluate current urban forest inventory efforts.
- Investigate a national continuous urban forest inventory and assessment protocol.
- Propose an implementation strategy and recommend funding mechanisms.

Rangeland Inventory. The FIA program could be extended to data collection for rangelands currently not included in the FIA. Monitoring would be for purposes of tracking health, productivity, and sustainability at the strategic level. Developing such a system would require clear definitions of rangeland to define the sample frame. Careful consideration should be given regarding whether the effort should be restricted to public rangeland or should also expand to include

private rangeland. (The NRI currently surveys range on private but not public lands.) No consistent strategic-scale inventory and monitoring system across both private and public lands is in place, yet the needs exist for similar sorts of information as reported by FIA for forested lands. The 2002 House Interior Appropriations Committee report included language directing the Secretaries of Agriculture and the U.S. Department of the Interior to collaborate in implementing a rangeland monitoring system.

Other Treed and Riparian Land Inventory. The FIA program could be extended to data collection for other lands with trees that do not fall neatly into the range or urban definition. Examples include narrow riparian features, windrows, agroforestry stands, and other trees that exist in situations that do not currently meet the definition of forest and that, therefore, are not currently sampled. This strategic-level monitoring could track health, biodiversity, carbon sequestration, wildlife corridors and habitat, and the trends on all treed land. In combination with a rangeland and urban extension, such an approach would ensure that all trees in the United States would be sampled by FIA in proportion to their occurrence. There would no longer be any gaps in the nationwide monitoring of trees and their various associated ecosystems. In particular, an extension to other treed and riparian land would include a small but ecologically important set of trees that would be of especially high interest in arid land ecosystems where trees that are not part of a larger contiguous forest are important.





Wildlife Habitat Monitoring. FIA has long used forest inventory measurements to infer information about habitats for animal and plant species. This application is increasing, as managers must monitor changes in habitat components to mitigate concerns about management actions on species viability. Now, sustainability of timber management programs and applications of standards and guidelines, such as “Survey and Manage,” depend on FIA data. Standard FIA indicators, plot size, and measurements protocols, however, can miss important habitat components. For example, the geographic scale of a habitat component might not match the scale of a one-twentyfourth-acre FIA subplot or a 1-acre FIA field plot. Enhancements or embellishments might be needed to the traditional FIA design and processing procedures. As management decisions in the NFS become increasingly affected by issues related to habitats for threatened and endangered species and other featured species, FIA can provide research and development into new ways to address these significant management challenges.



Inventory and Monitoring of Special Forest Products. Forests are frequently managed and harvested for a variety of specialty products, such as medicinal plants, traditional foods, and decorative plants (e.g., holly, mistletoe, and fir branches). Current FIA protocols generally do not measure such products, but sampling protocols could be added to quantify the status and trends in volume and value of these products. One result of reductions in the harvest of timber products on Federal lands is increased opportunities for and interest in commercial possibilities for specialty products. New industries, many of them community based and small in

scale, would benefit from knowledge about the approximate distribution, quantity, value, and sustainability of such products.

GUIDING PRINCIPLES

In implementing the program, FIA will be guided by the following principles. FIA will—

- Take the lead in inventorying and monitoring changes in the Nation’s forests, forest resources, and forested ecosystems.
- Maintain emphasis on conducting statewide forest resources inventories while conducting a balanced program of research to advance knowledge on multiresource assessments and forest health monitoring.
- Actively participate in developing inventory methods and new techniques that will assist the NFS in meeting the requirements of the National Forest Management Act.
- Operate to maintain the best possible working relationships with its clients, cooperators, and Congress and will publish annual reports on its progress.
- Provide opportunities for client and cooperator access to its management process.
- Protect the confidentiality of land-owners’ and mill operators’ information (FSA 1985).
- Preserve its legacy data and make it accessible to partners and clients.
- Strive to establish universal protocols that ensure comparability of statistics in regard to common national and international data reporting.

- Focus on its primary mission to serve the people of this Nation but recognize that many problems may require a multinational or global approach.
- Actively engage and collaborate with scientists and experts from universities, other agencies, and nongovernment organizations to assure the highest quality research.
- Recruit, train, and retain a competent and highly dedicated workforce from all segments of the Nation's population and encourage creativity and innovation in its people.

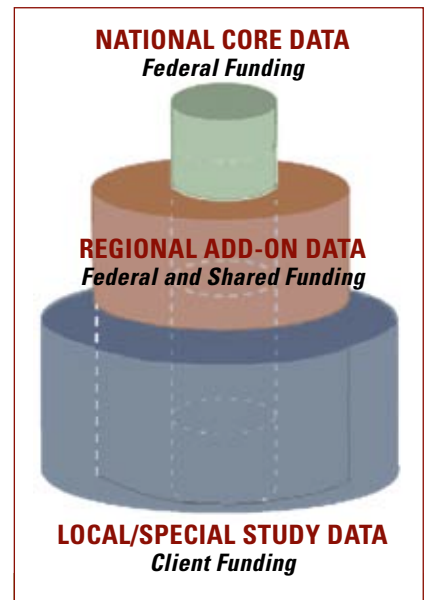
FIVE-YEAR GOALS

This strategic plan is forward looking and balances emerging client demands for new information, tools, and value with hard decisions on priorities and budget constraints. This plan identifies the mission, vision, strategic goals, research, and organizational functions that will be funded as part of the FIA program, along with the principles that will guide us. With all this in mind, FIA is committed to engaging the best people and technology to fulfill its mission to improve the understanding and management of our Nation's forests by maintaining a comprehensive inventory of the status and trends of the country's diverse forest ecosystems, the use of those forests, and the health of the ecosystems. A brief recap of the major goals for the next 5 years follows:

- Complete implementation of the FIA Base Federal Program in all 50 States and periodic inventories in all special areas (Caribbean and Pacific Islands and interior Alaska) by 2008.

- Complete 5-year reports for all annualized States initiated by 2002.
- Integrate core data from all phases of the inventory and regional add-ons into NIMS by 2007.
- Develop and document components of change procedures (growth, removals, and mortality) and integrate into NIMS by 2007.
- Work with NFS to develop tools and products to assist in forest planning.
- Complete and report on the first cycle of the NWOS and integrate data into online systems.
- Annualize the Timber Products Output and Ownership Survey and integrate data into online systems.
- Complete a suite of Web tools to improve client access to FIA data and assist in analysis.
- Develop and document a suite of spatial tools and products (forest cover maps, volume/biomass maps, fire and other risk maps).
- Continue to explore urban, rangeland, and other treed land monitoring opportunities.

We hope you will take some time to study the plan and give us your feedback directly or through one of our many users groups. (See the address page at the end of this report to contact the FIA unit in your area or log on to <http://fia.fs.fed.us>.) We look forward to partner and client input because such feedback has been the hallmark of FIA's history of success and will be the primary driver of our dynamic future.



FIA's core design provides flexibility for integration of new data at multiple scales.



LITERATURE CITED

American Forest Council (AFC). 1992. Report of the Blue Ribbon Panel on Forest Inventory and Analysis. Washington, DC: American Forest Council. 11 p.

American Forest and Paper Association (AFPA). 1998. Forest Inventory and Analysis program: the report of the second Blue Ribbon Panel. Washington, DC: American Forest and Paper Association. 17p.

Federal Register (FR). 2005. Action: USDA Forest Service notice of issuance of agency interim directive. Federal Register 70(45).

U.S. Department of Agriculture (USDA) Forest Service. 1993. A blueprint for Forest Inventory and Analysis research and vision for the future. Program Aide No. 1512. Washington, DC: USDA Forest Service. 20 p.

USDA Forest Service. 1999. Strategic plan for Forest Inventory and Monitoring. Washington, DC: USDA Forest Service. 48 p.

United States Government Accountability Office (GAO). 2004. Environmental indicators: better coordination is needed to develop environmental indicator sets that inform decisions. GAO-05-52. Washington, DC: GAO. 122 p.

PRIMARY LAWS

Public Law of June 4, 1897
Organic Administration Act of 1897 (16 U.S.C. §473)

Public Law 93-378
Resources Planning Act of 1974 (16 USC §1601)

Public Law 94-588
National Forest Management Act of 1976 (90 Stat. 2949)

Public Law 95-307
Forest and Rangeland Renewable Resources Research Act of 1978 (16 USC §1641, which repealed the McSweeney/McNary Act of May 1928)

Public Law 99-198
Food Security Act of 1985 (7 U.S.C. §2276)

Public Law 100-521
Forest Ecosystems and Atmospheric Pollution Research Act of 1988 (16 USC §1600)

Public Law 105-185
Agricultural Research, Extension, and Education Reform Act of 1998 (16 USC §1642, which amended the 1978 Research Act and required FIA inventory measurements in all States annually and forms the basis of this strategic plan).

CONTACTS

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

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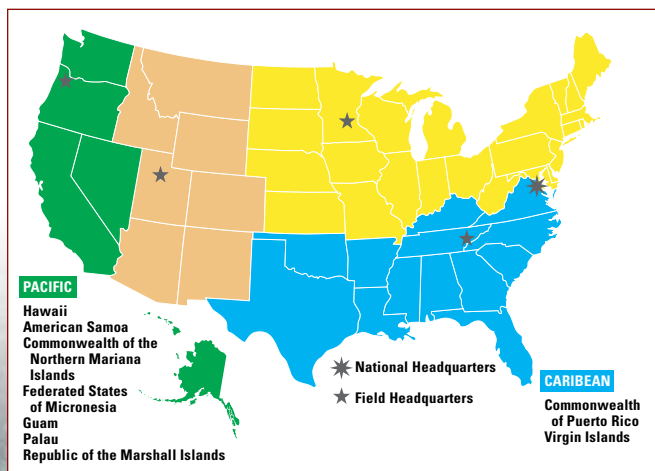
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All our regional Internet home pages, as well as a wealth of statistical and other information, are available through the national FIA homepage located at <http://www.fia.fs.fed.us>.



FIA summary statistics and performance measures for 1999-2005

| PROGRAM FUNDING | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
|--|-------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | <i>thousand dollars</i> | | | | | | |
| <i>Apropriated funds*</i> | 26,770 | 39,497 | 45,697 | 50,523 | 56,234 | 56,652 | 60,881 |
| <i>Other Federal funds**</i> | 1,173 | 601 | 3,460 | 5,397 | 3,437 | 6,073 | 1,776 |
| Total Federal funds | 27,943 | 40,098 | 49,157 | 55,920 | 59,671 | 62,725 | 62,657 |
| Total partner funds | 4,586 | 7,437 | 8,291 | 8,656 | 10,164 | 7,479 | 6,379 |
| Total available funds | 32,529 | 47,536 | 57,179 | 64,574 | 69,834 | 70,204 | 69,036 |
| PROGRAM EXPENSES and BALANCES | | | | | | | |
| Administration | 1,910 | 2,607 | 2,867 | 3,306 | 3,172 | 3,430 | 3,065 |
| Image processing | 951 | 1,305 | 1,362 | 905 | 967 | 940 | 1,218 |
| Field operations | 10,592 | 15,273 | 19,576 | 23,045 | 24,766 | 25,247 | 26,409 |
| Data/information | 3,647 | 5,512 | 5,849 | 5,801 | 6,719 | 9,448 | 7,394 |
| Analysis | 2,406 | 3,019 | 3,493 | 3,440 | 3,484 | 3,967 | 4,161 |
| Research | 2,173 | 4,055 | 4,117 | 3,413 | 4,312 | 3,975 | 3,477 |
| Miscellaneous/other | 686 | 1,206 | 1,180 | 627 | 3,829 | 4,351 | 3,963 |
| Total direct expense | 22,367 | 32,976 | 38,444 | 40,535 | 47,249 | 51,357 | 49,687 |
| Indirect expenses | 4,858 | 6,892 | 9,228 | 13,025 | 11,123 | 8,919 | 11,313 |
| Total Federal expense | 27,225 | 39,868 | 47,672 | 53,560 | 58,372 | 60,277 | 61,000 |
| End-of-year Federal balance | 718 | 230 | 1,485 | 2,359 | 1,298 | 2,448 | 1,657 |
| TOTAL FEDERAL FUNDS | 27,943 | 40,098 | 49,157 | 55,920 | 59,671 | 62,725 | 62,657 |
| Category as percent of total Federal funds | | | | | | | |
| Administration | 6.8% | 6.5% | 5.8% | 5.9% | 5.3% | 5.5% | 4.9% |
| Image processing | 3.4% | 3.3% | 2.8% | 1.6% | 1.6% | 1.5% | 1.9% |
| Field operations | 37.9% | 38.1% | 39.8% | 41.2% | 41.5% | 40.3% | 42.1% |
| Data/information | 13.1% | 13.7% | 11.9% | 10.4% | 11.3% | 15.1% | 11.8% |
| Analysis | 8.6% | 7.5% | 7.1% | 6.2% | 5.8% | 6.3% | 6.6% |
| Research | 7.8% | 10.1% | 8.4% | 6.1% | 7.2% | 6.3% | 5.5% |
| Miscellaneous/other | 2.5% | 3.0% | 2.4% | 1.1% | 6.4% | 6.9% | 6.3% |
| Indirect | 17.4% | 17.2% | 18.8% | 23.3% | 18.6% | 14.2% | 18.1% |
| End-of-year balance | 2.6% | 0.6% | 3.0% | 4.2% | 2.2% | 3.9% | 2.6% |
| All categories | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Grants as percent of total Federal funds | | | | | | | |
| Fieldwork grants | 4.7% | 12.1% | 11.4% | 9.8% | 14.4% | 10.1% | 9.6% |
| Research grants | 3.3% | 6.3% | 5.0% | 2.7% | 3.4% | 2.7% | 1.5% |
| Data/information grants | 0.2% | 2.3% | 1.6% | 1.2% | 2.6% | 4.1% | 2.0% |
| All Federal grants | 8.2% | 20.7% | 18.0% | 13.6% | 20.4% | 16.9% | 13.1% |
| Partner funds as percent of total program funds | | | | | | | |
| All partner contributions | 14.4% | 15.7% | 14.8% | 13.9% | 14.8% | 11.0% | 9.5% |
| OTHER MEASURES | | | | | | | |
| States with annual activity | 10 | 17 | 28 | 32 | 39 | 44 | 45 |
| States with FIADB 1-2 yrs old | n/a | n/a | n/a | 5 | 14 | 28 | 40 |
| Federal employees | 296 | 342 | 374 | 400 | 403 | 426 | 447 |
| Other employees | 45 | 169 | 179 | 160 | 180 | 166 | 179 |
| Total employees | 341 | 511 | 553 | 560 | 583 | 592 | 626 |
| P2/3 forest plots | 8,943 | 11,582 | 14,927 | 16,108 | 17,182 | 16,036 | 15,675 |
| P2/3 nonforest plots | 14,845 | 16,767 | 24,982 | 24,459 | 29,592 | 29,532 | 24,445 |
| Total plots | 23,788 | 28,349 | 39,909 | 40,567 | 46,774 | 45,568 | 40,120 |
| All QA plots | 1,427 | 1,701 | 1,658 | 1,889 | 2,332 | 2,874 | 3,584 |
| Percent QA plots | 6% | 6% | 4% | 5% | 5% | 6% | 9% |
| All publications | 91 | 167 | 116 | 167 | 138 | 114 | 164 |
| Journal publications | 24 | 28 | 28 | 28 | 23 | 25 | 34 |
| Percent journal publications | 26% | 17% | 24% | 17% | 17% | 22% | 21% |
| Consultations, number | n/a | n/a | 921 | 819 | 1,450 | 1,566 | 1,510 |
| Consultations, hours | n/a | n/a | 3,751 | 2,978 | 4,514 | 4,899 | 5,612 |
| User/mangement meetings | 8 | 7 | 14 | 18 | 16 | 20 | 23 |
| Spatial data requests filled | n/a | n/a | n/a | 29 | 44 | 66 | 145 |
| MapMaker acceses | n/a | n/a | n/a | 11,579 | 14,577 | 26,034 | 55,000 |

* Net of rescissions.

** Includes return of previous year carryover, return of fire transfers and additional Research Deputy commitments.



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