



This overview provides a summary of various activities of FIA that are of critical importance to National Forest Systems. Opportunities to utilize FIA data to put NFS lands into the larger perspective of the landscapes in which they reside are outlined.

## ***FIA Program Perspective***

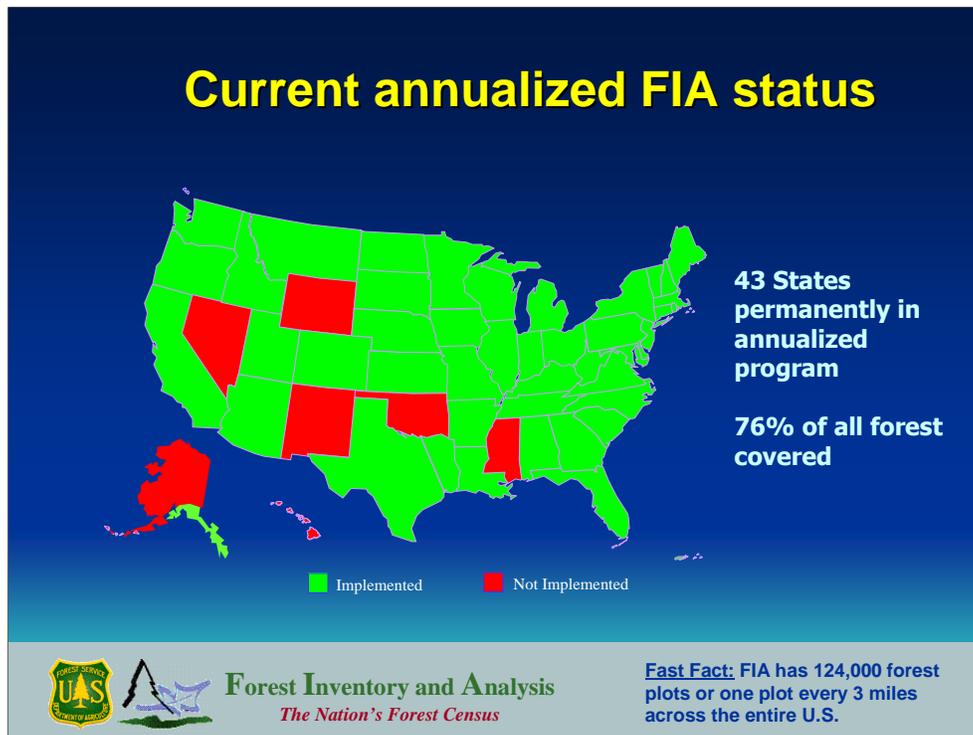
- *Only comprehensive forest inventory for each of the 50 States, Puerto Rico, and Trust Territories*
- *Switched from periodic State by State cycle in 1999 to annualized system designed to operate in every State every year*
- *FIA budget has been less than 2% of the annual Forest Service budget for 75 years*



**Forest Inventory and Analysis**  
*The Nation's Forest Census*

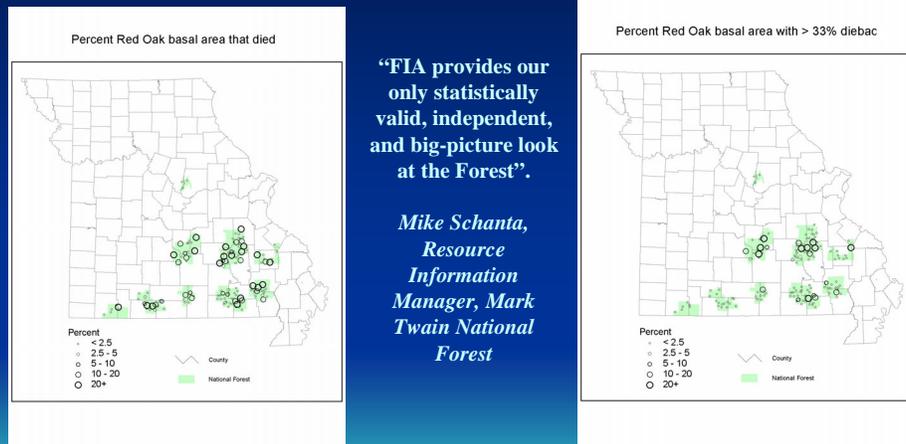
**Fast Fact:** In 1928, FIA became the 3<sup>rd</sup> nationwide forest inventory in the world.

FIA was the third nationwide forest inventory in the World in 1928 and is truly a unique entity- a Forest Service 'Crown Jewel'. Someone once said that if you tried to create a single national inventory program like FIA today it would be nearly impossible. Every land management agency in the government plus EPA and NOAA would be lobbying for control. One needs only look at Canada, Mexico, and Australia who are struggling to get national inventories in place to see just how tough it can be. And, amazingly, virtually none of the other 8 Montreal Process countries have one either and many have asked FIA for advice on critical implementation strategies.



In FY 2004, FIA will be fully implemented in 43 States covering 76% of the Nation's forests (90% outside of interior Alaska) with about 80% of target funding in place. FIA's goal, and its customers greatest desire, is to get 100% coverage of the U.S. by FY 2006. The funding gap is \$16.6 million for FY 2006 to get 100% annualized FIA coverage in all 50 States, Puerto Rico, and the Trust Territories as mandated by the 1999 Farm Bill amendment to the Renewable Resources Research Act of 1978.

## Analyzing oak decline on the Mark Twain National Forest



Forest Inventory and Analysis  
*The Nation's Forest Census*

**Fast Fact:** FIA has over 24,000 forest plots on NFS land.

Assessment of red oak mortality and dieback on Mark Twain National Forest. Analysis conducted in support of current Forest Planning efforts.

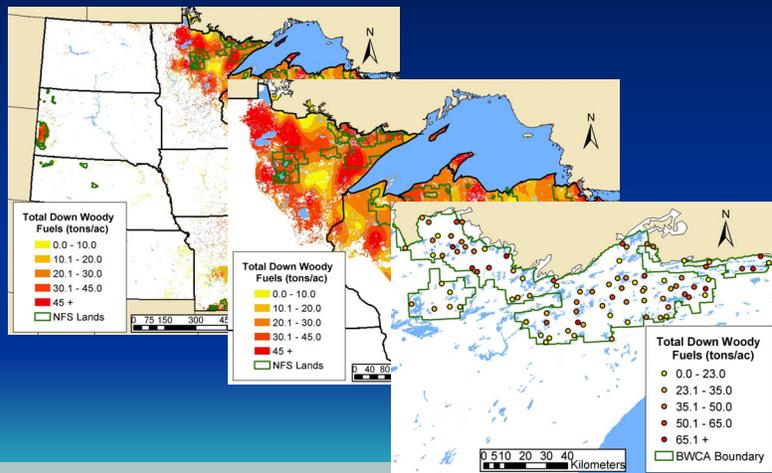
According to Mike Schanta, Resource Information Manager for the Mark Twain National Forest:

“Oak decline is a major concern and a focus in this round of Planning. The Analysis was very helpful to the Forest and its partners.

FIA provides our only big-picture look at the Forest. Under the Forest Mgmt Act all Forests are required to have a valid forest inventory.

FIA not only serves that purpose but also functions as independent third-party data source.”

## Putting the Green Line into Context FIA down woody fuel estimates



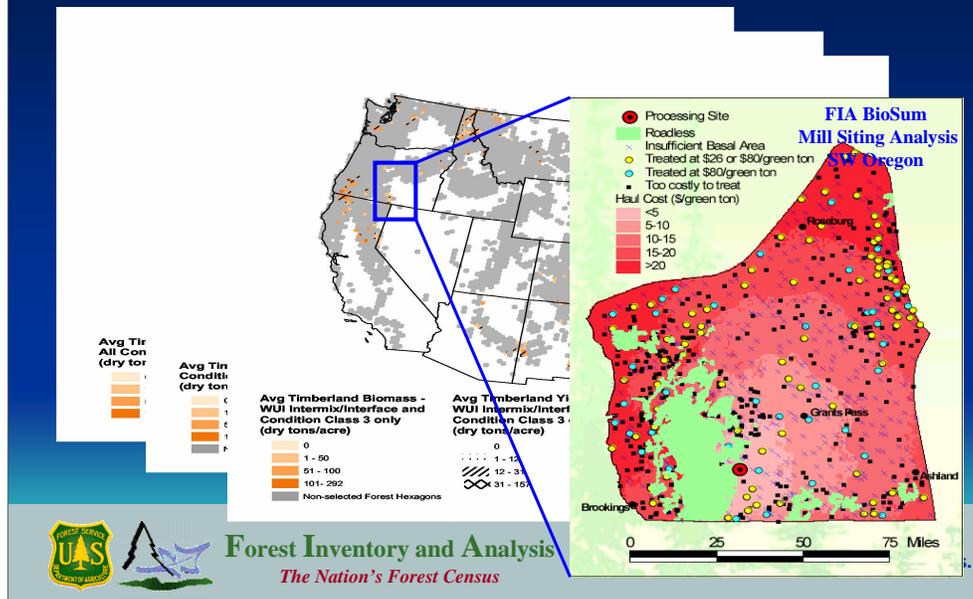
Forest Inventory and Analysis  
*The Nation's Forest Census*

**Fast Fact:** Each year FIA measures over 15,000 forest plots across the U.S., over 2,400 on NFS land

### Animation Slide:

- First image depicts estimates of total down woody fuels (1-, 10-, 100-, 1000-hr, duff, litter fuels) for north central states. Map based on 384 Phase 3 plots. Map may aid regional efforts to assess location of extreme fire hazards in relation to NFS lands.
- Second map is a “zoom” in of fuel estimates solely for Bailey’s ecological province 212. This may aid regional forests with gauging their fuels in context of fuel estimates of their greater forest ecosystem.
- The third map is a “zoom” in of the Boundary Waters Canoe Area Wilderness of the Superior National Forest (Phase 3 plots depicted). FIA intensified Phase three down woody material plots in the wilderness area to better quantify changes in this forest ecosystem following the blowdown event of July, 1999 (in cooperation with Minnesota DNR and Superior NF).
- Maps were made with annual data from North Central FIA (all data collected between 2001 and 2002).

# Hazardous Fuels Reduction strategic assessment & tactical planning tools



FIA Strategic Assessment & Tactical Planning Tools for Hazardous Fuels Reductions.

Zoom 1- Forest Treatment Evaluator – Strategic tool for identifying, evaluating, and prioritizing fuel treatment opportunities – Westwide 94 million acres of treatable timberland.

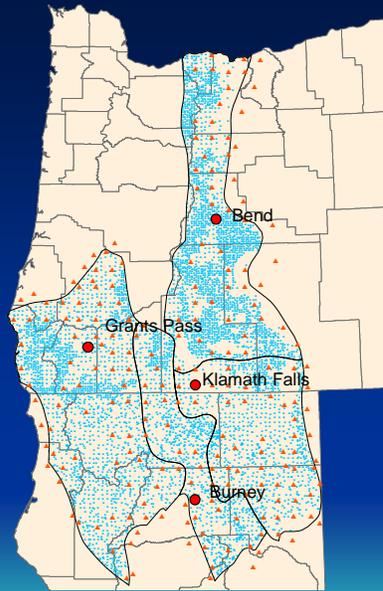
Zoom 2- 27 million acres of treated timberland in Fire Regime Condition Class 3 – hot spots of treatment opportunity in greatest need of fuel reduction treatments.

Zoom 3- 13 million acres of Condition Class 3 treatable timberland also in WUI interface/intermix classes – highest-priority hot spots in greatest need of fuel reduction treatments and in close proximity to people and places.

Zoom 4- FIA BioSum a tactical tool for comparing cost/benefits of treating hazardous fuels and utilizing the biomass removed.

## Using the FIA BioSum framework to simulate:

- Fuel reduction at FIA Plots - costs, yields, effectiveness
- Haul cost to potential processing sites
- Net revenue, area treated, yield
- “Hot-spots” of potential biomass accumulation
- Based on a statistically representative sample of entire landscape



**Forest Inventory and Analysis**  
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**Fast Fact:** FIA data are the basis for official carbon estimates for U.S. forests.

Forest managers charged with implementing the Healthy Forest Restoration Act are keenly interested in identifying areas where fuel treatment could prove feasible and effective over broad landscapes. At the same time, firms considering investments in biomass-based electricity generation and agencies interested in supporting economic development in rural communities are seeking to identify “hot spots” of potential accumulation of woody biomass and merchantable wood derived from landscape-scale fuel treatments. Forest vegetation data collected by the Forest Inventory and Analysis program across the entire U.S. on a systematic, statistically representative sample of the entire landscape is well-suited to support analyses that address these questions.

FIA BioSum is an analytic framework which combines and integrates three publicly available, off-the-shelf models (the Forest Vegetation Simulator (FVS), the Fire and Fuels Extension (FFE), and FRCS (a fuel reduction cost simulation estimation system) with forest inventory plot data and digital representations of road networks.

Key Strengths of FIA BioSum:

- Based on statistically representative sample of the entire landscape.
- Uses readily available, widely accepted models.
- Rasterized haul cost approach allows inclusion of haul costs with reasonable processing time.
- Allows analysis of any wood processing option.
- Provides information on changes in landscape conditions.

## BioSum outcomes driven by goals

**Scenarios 1-4:** treat all treatable acres, regardless of cost.

**Scenarios 1A-4A :** treat only acres that generate positive net revenue.

Scenario (what to maximize)	Net Rev billion \$	Ac Treated millions	Merch Cu Ft billions	Tons Biomass millions
1 Net Revenue	-2.5	6.8	15.4	34
2 Hazard reduction	-5.3	6.8	15.6	38
3 Merchantable yield	-4.3	6.8	17.1	36
4 Minimize MerchYld	-9.4	6.8	6.2	36
1A Net Revenue	5.2	2.8	10.3	16
2A Hazard reduction	4.5	2.4	9.1	15
3A Merchantable yield	5.2	2.7	10.3	16
4A Minimize MerchYld	1.0	1.0	2.5	8



**Forest Inventory and Analysis**  
*The Nation's Forest Census*

**Fast Fact:** Annualized FIA has over 200 million acres of U.S. forests with spatial or temporal sampling intensification at partner expense.

Analytic outputs, which are applicable at the National Forest, ecoregion and even multi-state scale, include: 1) scope of current fuel hazard, 2) extent to which fuel treatments can be expected to bring genuine hazard reduction, 3) extent to which fuel treatments can pay for themselves, 4) potential locations for building biomass-fired electrical generation plants and conventional wood processing facilities, 5) costs and revenues associated with treating broad landscapes under a variety of assumptions, objectives and scenarios, and 6) effectiveness and economic attractiveness of numerous alternative prescriptions for a large, representative sample of the forested landscape.

Results for this FIA BioSum analysis:

- fuel treatments that thin from below to a residual basal area of 60 sq ft. per acre, with high or no maximum harvested tree diameter limit specified, nearly always maximize net revenue, merchantable yield, biomass yield, and torching index improvement;

- treatments with low maximum harvested tree diameter limits were most commonly selected when the objective was set to minimize merchantable yield

- 6.8 million out of 21 million forested acres could be treated effectively if for each acre, the treatment selected maximizes net revenue

- 2.5 million of these treatable acres could also generate positive net revenue

- 90% of the woody material, by weight, and nearly all the value removed would be merchantable

- haul costs would make it infeasible to utilize the biomass-sized material (small trees, tops, limbs, etc) on about half of the treated area

- if all effectively treatable acres are thinned, biomass-based energy generation plants would have sufficient material to run for 6-29 years

- if only acres that generate positive net revenue are treated, such plants would run out of material in 3-12 years

- less than 1 percent of the treatable area falls within the wildland urban interface or intermix; 10 percent of the treatable area is wildland

- 90% of the treatable land within the WUI is non-federal.

## Mapping vegetation in Alaska



*John Caouette  
Statistician  
USDA Forest Service  
Region 10*



“I have been using the Forest Inventory and Analysis data to estimate stand characteristics for mapped vegetation strata used in the Tongass Land Management Plan. These strata estimates helped guide forest-level planning, project planning, and research. Combining FIA data and vegetation mapping is proving useful not only in the Tongass, but other National Forest systems as well.”



**Forest Inventory and Analysis**  
*The Nation's Forest Census*

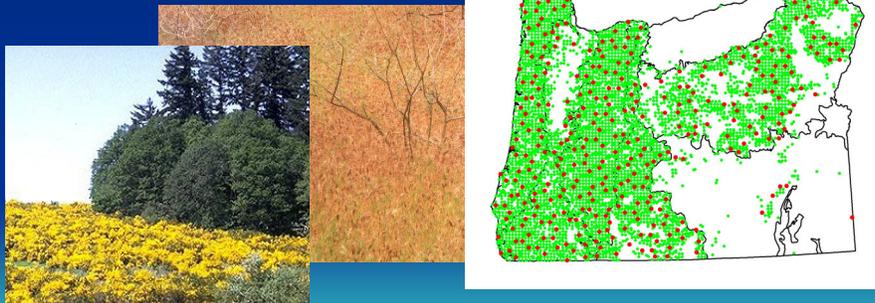
**Fast Fact:** The FIA database has data for 105 SAF forest types.

FIA plays a critical role in filling gaps for much needed landscape data and analysis in support of Forest Planning.

## Monitoring invasive plants

\* National development of vegetation indicator of forest health, based on sampling entire vascular plant community on forest health monitoring plots.

\* Sampling of selected high-priority invasive species to meet local management and information needs.



Forest Inventory and Analysis  
*The Nation's Forest Census*

**Fast Fact:** The FIA database has recorded data on nearly 300 species of trees.

Nonnative plants have tremendous ecological and economic impacts on plant communities globally, but comprehensive data on the distribution and ecological relationships of individual species is often scarce or nonexistent. Systematic sampling of vascular plant composition with a consistent protocol over an entire region can provide valuable baseline information for single-species surveys and control efforts. In addition, systematic sampling of entire plant communities allows statistical evaluation of abundance and distribution, as well as investigation of habitat relations and impacts on associated species.

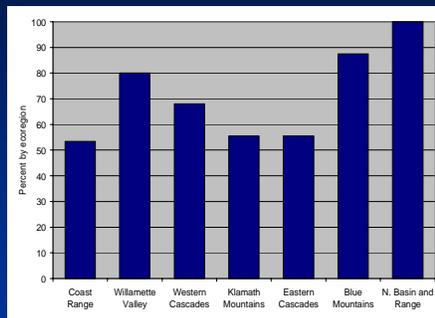
The national FIA program has been developing a complete vascular plant inventory in order to assess forest health on the “forest health” or “phase 3” (P3) subset of the national FIA plot grid (one plot per 96,000 acres). This inventory has been tested in individual states across all FIA regions.

In addition, in some regions, some sampling of non-tree species is done on the standard “phase 2” (P2) FIA plot grid (one plot per 6,000 acres). For example, Region 5 has developed a short list of invasive species which are recorded when found on their lands, and a list of invasive species is used for all lands in south-eastern states. Other NFS regions have expressed interest in developing lists for their lands as well.

Two successive years of the full forest-health sampling across all forest lands in Oregon (110 plots) were examined to assess the utility of the data collected.

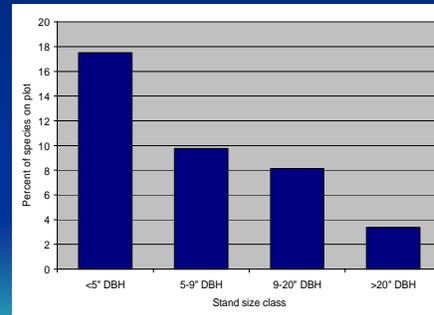
(Figures: Oregon showing full FIA (P2) grid and subset of forest health (P3) plots for illustrative purposes [not all plots sampled using invasive protocols yet]. Photos show scotchbroom and conifer forest, and cheat grass in rangeland.)

## Analyzing non-natives species



Proportion of plots per ecoregion with one or more non-natives species

Average proportion of species per plot that are non-natives species



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The Nation's Forest Census

**Fast Fact:** FIA has worked in close partnership with the States for over 75 years in the conduct of forest inventory.

The pilot study provided information concerning the current distribution and abundance of nonnative plants in Oregon that has not been available before. Because of the systematic sample design, results automatically apply to the entire population (forest lands in Oregon) or the subpopulations sampled.

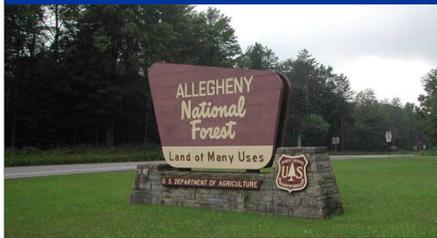
\* Upper left graph: Across Oregon, 70% of all plots had at least one nonnative species on them. Proportions were highest in the Willamette Valley, Blue Mountains, and Basin and Range ecoregions. This is a sobering result, indicating the pervasiveness of nonnative plants. But are nonnative species having a significant impact on these forests?

\* Upper right graph: Nonnative species made up the greatest proportions of total species in the smallest (and youngest) stand size classes. Proportions declined with increasing stand size. This trend held for different forest types.

\* Lower graph: Another way of assessing impacts is in terms of the amount of vegetation cover made up by nonnatives. Most of the time, nonnative species made up a small proportion of the total cover, but in some forest types that was not always the case. (Note that one "maximum" proportion plot represents 96,000 acres on average).

Although relatively few stands were dominated by nonnative species, nonnatives had significant impacts in some forest types and stand size classes. FIA plots provide a wealth of information that is valuable in evaluating distribution of nonnative species. Stand structure, landform, management history, and climate data have allowed the development of predictive models of species' occurrence (not shown). These models have indicated, for example, which invasive species increase dramatically in response to forest thinning treatments, while others do not. The combination of both sampling systems can provide solid baseline statistics about plant distribution, as well as detailed ecological information for focal plants.

## Monitoring forest health



"The Allegheny National Forest has intensified the FIA Phase 3 sample grid because these measurements are so vital to monitoring forest health as part of our Forest Plan implementation and revision efforts." -Kevin Elliott, Forest Supervisor, Allegheny National Forest



American Chestnut Down Woody Material – Chestnut Blight is an invasive



Knotweed is a new species that needs monitoring



Forest Inventory and Analysis  
The Nation's Forest Census

**Fast Fact:** Last year, FIA online databases had over 15,000 information downloads.

The Allegheny National Forest has invested in collecting FIA Phase 3 Forest Health variables at twice the Phase 2 intensity (thirty-two times the standard intensity) - that's how important it is.

This 30-inch chestnut succumbed to Chestnut Blight early in the century and was tallied as a standing dead tree in 2002. It has since fallen and will now be tracked by the Phase 3 Down Woody Material (DWM) inventory - recall that Chestnut Blight is an invasive species.

Knotweed is one of the more pervasive exotic invasive species encountered in Pennsylvania forests and threatens native forest understory flora. The Phase 3 Vegetation Survey tracks this species.

To quote Keith Elliot, Forest Supervisor on the Allegheny National forest: "The Allegheny National Forest has intensified the FIA Phase 3 sample grid because these measurements are so vital to monitoring forest health as part of our Forest Plan implementation and revision efforts."

## Monitoring urban forest health

Urban areas contain 25% of nation's tree cover and 80% of population, but little is known about this valuable forest resource. Projects include:

- an assessment of trees on nonforest land in urban and rural areas around Baltimore
- forest health monitoring pilot study on FIA plots in urban areas in IN, WI, MA, MD and NJ.



Forest Inventory and Analysis  
*The Nation's Forest Census*

**Fast Fact:** FIA provided data for 10 of 18 indicators in the State of the Nation's Ecosystems Report.

Urban areas contain 25% of the nation's tree cover and 80% of the population, but little is known about this valuable forest resource.

In 1999 a pilot project in Maryland inventoried all FIA 'nonforest' plots in five counties around Baltimore. Results indicate that there is a substantial amount of tree cover on nonforest plots, adding 43.2 percent to the total tree basal area previously reported for the area. Nonforest areas contained fewer tree species but a higher number of exotics. On average, nonforest plots had fewer but larger trees, and nonforest areas typically had little natural reproduction in the understory.

Interest in monitoring urban forest health at regional and national scales is growing. The Northeastern Research Station, NA State & Private Forestry, the FHM Program, NE-FIA, and our state partners developed a pilot program called Urban Forest Health Monitoring. Tests are being conducted in IN, WI, MA, MD and NJ using FIA nonforest plot locations in urban areas. State and Private Forestry has developed a plan to expand this effort to the whole country.

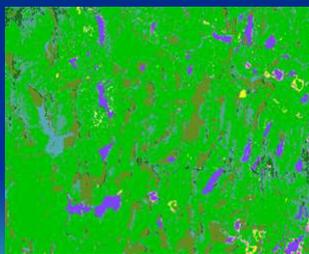
## Monitoring Fragmentation and Urbanization in the Northeast

forest land is being increasingly fragmented and urbanized

FIA is conducting a region-wide assessment of fragmentation and is collaborating on various studies on the effects of fragmentation and urbanization, and the identification of the most relevant attributes (and scales) to monitor.



The assessment is in cooperation with other NE research units, NA State & Private Forestry, other federal agencies, and our State partners.



Forest Inventory and Analysis  
*The Nation's Forest Census*

**Fast Fact:** FIA has conducted 3 national surveys of private woodland owner objectives since 1978.

Left graphic: National Land Characterization Dataset (1992) of northeastern PA.

Right graphic: Same graphic with roads added in 2000 – illustrates increasing urbanization and resultant fragmentation and parcelization over time. In this particular case, it demonstrates that satellites may be unable to detect ex-urban development in forested areas.

Forestland is being increasingly fragmented and urbanized. In southern New England, for example, between 48 and 62% of the forest is less than 200 meters from a road. Increasing urbanization and ex-urban growth is creating a new context for neighboring areas of forestland, with the potential to influence forest health, the presence of invasive species, forest composition and structure, wildlife sustainability and diversity, water quality, timber management opportunities, and recreation opportunities. In order to monitor this situation in the northeast, FIA is conducting region-wide assessments of the status of urbanization and forest fragmentation, and integrating that knowledge with information regarding its effects. FIA is cooperating with and facilitating additional research studies that improve our knowledge of the effects of fragmentation and urbanization, thereby continuing to improve monitoring efforts over time. FIA is also working to improve existing monitoring techniques by overcoming limitations to effective monitoring such as insufficiently accurate nationwide datasets, and identifying techniques to consistently measure the particular parameters (and scales) most relevant to the issues at hand from the above studies. These efforts are being conducted in cooperation with other NE research units, NA State & Private Forestry, National Forest System, other federal agencies such as the USGS National Water Quality Assessment (NAWQA) program, and our state partners.

## Providing large-scale assessments

**FIA is a trusted, reliable source of cost effective, landscape-scale data**

- Assessment information is used for program direction, policy needs and Forest Planning options. Recent examples include:
  - Southern Appalachian Assessment, 1996
  - Ozark-Ouachita Highlands Assessment, 1999
  - Southern Forest Resource Assessment, 2002
    - Ten of 25 chapters used FIA data
    - SRS and R8 provided joint leadership



**Forest Inventory and Analysis**  
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**Fast Fact:** Each year FIA revisits 5-10% of all plots measured to assure quality.

Large-scale assessments are important for a variety of reasons—including use in National Forest planning, setting policy direction for forestry programs, gauging sustainability, etc. A total of three large-scale assessments have been accomplished in the South. These have been done without large budgets, or with special appropriations. The only way such assessments can be accomplished in a cost effective manner is to use data that are already available. FIA data is ready made for such assessments. For the three in the South—Southern Appalachian Assessment, Ozark-Ouachita Highlands Assessment, and the Southern Forest Resource Assessment—special FIA data bases were developed and applied to the questions for the assessments. The Southern Forest Resource Assessment is the latest of these and it has set the tone for the future of forestry in the South. The nature of FIA data provides high utility for use in these assessments: the data are uniform and consistent across all forest lands, regardless of reserved status or ownership. Such data are particularly valuable for National Forest planning, as the NFS lands can be placed in context with surrounding ownerships. In the words of John Greis, S&PF, R8, co-leader of the Southern Assessment, “there is no doubt at all that FIA data provided the foundation for the assessment; the FIA information was absolutely essential and provided the definitive detail for the report.”

## Assessing Non-Timber Forest Products (NTFPs) economically and culturally significant for National Forests

FIA is supporting  
SRS-RWU-4702 in  
working with NFS to  
develop methods to  
routinely assess  
these products



Forest Inventory and Analysis  
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**Fast Fact:** FIA has over 17,000  
plots in Protected Forests.

One issue that is increasing in importance for Southern forests, especially on NFS lands, is the increasing use of non-timber forest products. While the FIA program collects a wide range of basic information about forest resources, there are always emerging issues that rise to importance. The FIA program has a small staff that researches additional needs for the program, and the program also collaborates with other researchers. Such is the case with non-timber forest products, where the SRS-FIA unit is collaborating with the Forest Products Conservation unit in Blacksburg, Virginia. Increasing levels of collection of non-timber forest products (also known as special forest products) have triggered concerns about the long-term social, ecological, and economic sustainability of the resources from which these products originate. At this time, there is too little information to assess the current situation and to make informed decisions about managing the forest resources for these products. These products include culinary items, medicinal and dietary supplements, among other things. While timber product output studies have long been a part of FIA, non-timber product impacts are difficult to assess. In the words of Gary Kauffman, Forest Botanical Specialist, National Forests of North Carolina, “the FIA (Knoxville) and SRS-4702 (Blacksburg) nontimber forest product output study efforts are groundbreaking and necessary and hopefully only the beginning of research and ongoing monitoring studies in this area of importance.”

## Developing accurate volume data

timber is still a major economic factor in the South

FIA developed taper equations for NFS timber in the South and later extended these equations to all southern forests

Result: NFS and FIA are implementing consistent, reliable technology for volume estimation throughout the South



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**Fast Fact:** FIA has routinely canvassed all primary wood-using mills in the U.S. since 1947.

Although the importance of timber relative to other uses may be declining on NFS lands, it is still a viable activity on many Forests, and certainly a major factor on private lands of the South. Thus, there is a great need to have accurate information regarding timber volume. Non-FIA scientists, in SRS-RWU-4104, developed new procedures for volume calculations that utilized taper functions and provided accurate volume data for a wide range of tree characteristics. These procedures were originally developed for use exclusively on NFS lands for NFS purposes, such as timber sales. However, data historically collected by Southern FIA were in a format where they could be added to the database for these equations. This new, enlarged database enabled the utilization of these new equations into the FIA process and extended over all ownerships. The cross-collaboration of these programs has provided benefits to both NFS and FIA. In the words of Alex Clark, SRS-RWU-4104, one of the developers of the new methodology, the resulting database that includes many thousands of trees measured by FIA is “the best taper data set in the world.”

## Providing a framework for a cooperative approach to management

“FIA provides the essential broad-scale framework for community-based forest management and promotes a cooperative strategy linking NFS, States, and the public.

In the immediate future, FIA will be critical to an effective forest monitoring effort.”

– John Palmer, Director, Vegetation Management, NFS Region 4



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**Fast Fact:** FIA has completed over 260 Statewide forest inventories since 1930.

From his past experience as a Forest Supervisor on the Allegheny National Forest, and his recent work both as a member of the FIA Executive Team and as the Director of Vegetation Management at Region 4, John Palmer has witnessed the value of using a cooperative and landscape level approach to Forest Management. John testifies that the most effective approach to planning and decision making for National Forests is through a cooperative effort with States, other Federal partners, private landowners, and citizens, and requires the use of up-to-date resource data and analyses that cross both ownership and reserved boundaries. Region 4 has also engaged FIA as a partner in helping to define appropriate and consistent questions for large-scale monitoring, capitalizing on the wealth of already-available information within the FIA program.

## Supporting Management Decisions and Forest Plans

“FIA data are critical to setting the broad-scale context for management decisions and are an essential part of the process to tie forest plans to finer scale projects. In addition, we recently used FIA data to provide the statistically defensible answer as to whether the Lolo NF had met forest plan standard of at least 8% old growth.”

- Renate Bush, NFS Region 1  
Inventory and Analysis, Missoula, MT



Forest Inventory and Analysis  
The Nation's Forest Census

**Fast Fact:** FIA crews measure over 400,000 trees each year

Following the first comprehensive inventory of the Region-1 National Forests in Montana, the Regional Inventory and Analysis staff began using FIA data to develop summaries of forest attributes and conditions for all forested lands, not just those in the “suitable base.” Recently a post-fire salvage logging operation on the Lolo National Forest was challenged in court; the plaintiff argued that old growth and woodpeckers were not adequately considered. The basic questions included: Was the Lolo meeting its Forest Plan standard of 8% old growth? Is the old growth well distributed? Is the Lolo meeting the large-diameter snag guidelines by Forest defined habitat type groups? The Regional Inventory staff, with support from FIA staff, used FIA plot data to provide statistically valid estimates of old growth (based on accepted definitions by Green et al) and illustrate both the confidence intervals associated with the data as well as distribution of the old growth throughout the Forest. The judge tossed the old growth portion of the lawsuit based on the sound evidence.

## Establishing a framework for Rangeland Indicators

“The good news is that the range folks in Region 4 are adopting the approach very quickly and applying the concepts into Forest Plans and allotment NEPA. The four criteria are easy for field folks to understand: invasive weeds, ground cover, shrub cover, and are the right plants there? Many forests are actually measuring these attributes in the field and starting to make health calls locally.”

- Curt Johnson—R-4 Rangeland Ecosystem Specialist regarding the “Indicators of Rangeland Health” pilot on the Bridger-Teton NF



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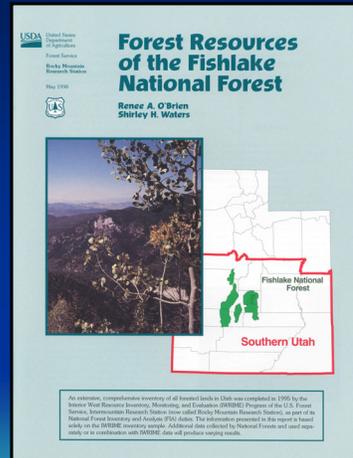
**Fast Fact:** The entire December 1999 issue of the *Journal of Forestry* was dedicated to the FIA Program.

FIA has not traditionally sampled nonforest lands, but as much as 30% of National Forests such as the Bridger-Teton (B-T) National Forest are nonforest by FIA definition. In an effort to gain information about the health and functionality of all cover types on the B-T, FIA and R-4 Vegetation Management staff conducted a cooperative study on the B-T that tested four indicators of rangeland health on all cover types: presence of noxious weeds, percent bare ground, percent shrub cover, and species composition. In addition, this pilot demonstrated the utility of the FIA plot framework for inventorying and monitoring non-forest at a strategic level. Results of the pilot have been favorably received and have demonstrated that rangeland health and functionality could be monitored using FIA protocols at the National Forest scale.

## Supplying information to promote understanding of the resources of our National Forests

“I took copies of the Fishlake report to all of the meetings that I attended that first year or two. I love the report. It is the most valuable handout or pamphlet that I have used to explain the Fishlake’s forest resources.”

- Ron Sanden, Forest Silviculturist, Fishlake National Forest



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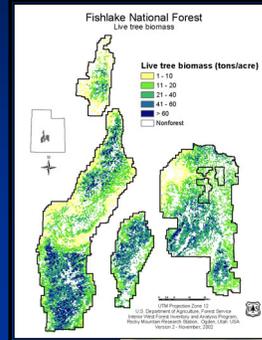
**Fast Fact:** FIA scientists have written or collaborated on over 1,400 nontimber related publications using FIA data since 1976.

In the late 1990's, after IW-FIA had completed for the first time the inventory of the National Forests in Utah, a cooperative decision was made between R-4 and IW-FIA to summarize the data in a report for each National Forest. As a result of this collaboration, color brochures were produced for all six Utah Forests, and have subsequently been produced for National Forests in Montana, Arizona, New Mexico, and South Dakota. These reports have proven to be popular, and because the formats are similar, the data can be compared between Forests and Regions. IW-FIA has even received a request for help in producing a similar report from a planner formerly from the Intermountain Region who now works on a National Forest in Oregon.

## Providing maps and data to support Forest Planning

“Resource maps and data provided by FIA have enhanced our understanding of properly functioning condition and helped us to determine desired conditions for the forest. These tie directly to aspects of fire, fuels, timber, wildlife, and watershed assessments, and provide needed support for the forest plan revision process.”

- Bob Campbell, Ecologist,  
Fishlake National Forest



Forest Inventory and Analysis  
The Nation's Forest Census

With GIS tools and flexible predictive models, we can enhance traditional FIA data summaries with spatial products of forest attributes. The Fishlake is a very diverse National Forest that supports a variety of cover types. IW-FIA has been collaborating with Fishlake staff and other researchers to provide spatially explicit maps of forest attributes to assist with strategic-level forest planning. Fishlake planners are incorporating these spatially explicit products into their planning procedures and integrating them with other digital data to help understand the spatial diversity in the landscape and make decisions related to wildlife habitat, marketable harvest areas, and desired future conditions. Eight forest attributes were identified that could be mapped and that would be useful for management planning: basal area, tree volume, tree biomass, tree crown cover, number of trees per acre, quadratic mean diameter, stand age, and net annual growth. The maps are also being used to determine areas needing special attention that may require more sampling or analysis with future stand exams.

## Supporting the NEPA Process

“I use the FIA forest publication for supporting NEPA purpose and need. An example is forest specific data on the trend in succession of aspen to conifer, which is supported by other West-wide studies.”

- *David M. Keefe, Silviculturist,  
Escalante Ranger District, Dixie  
National Forest, Region 4*

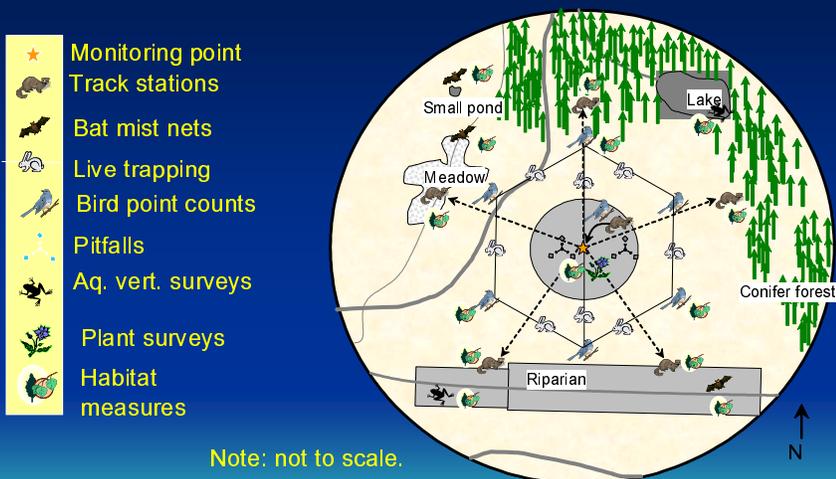


**Forest Inventory and Analysis**  
*The Nation's Forest Census*

**Fast Fact:** FIA provides online  
database access at [www.fia.fs.fed.us](http://www.fia.fs.fed.us)

The Forest Brochures provide useful data in a form that is easily understood and used by Forest personnel to communicate with their publics. The data are presented in such a way as to also introduce the entire database that is available for use by cooperators to support decisions relating to the Forest Planning Process and NEPA.

## Developing a multispecies inventory and monitoring protocols (MSIM)



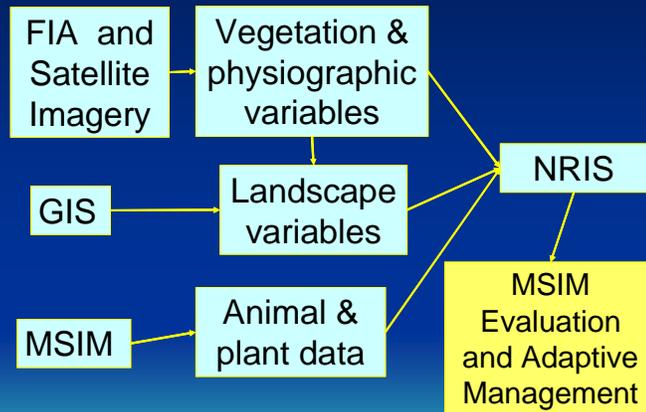
Forest Inventory and Analysis  
The Nation's Forest Census

**Fast Fact:** Overall tree mortality has remained below 1% of standing volume annually for over 50 years

The MSIM protocol is designed to be integrated with the FIA grid system. The FIA grid system is a hexagonal grid (each hexagon occupies about 6000 ac), with one FIA Phase II point randomly located within each hexagon. The density of the grid equates to an average of between 100 and 200 points per National Forest. Collocation with FIA affords the use of FIA vegetation data as a contribution to describing habitat conditions and to monitoring plant populations. It also provides a stable base for the implementation of the multiple detection methods. Implementation of MSIM protocol will be highly coordinated with FIA and we expect that MSIM data collection will not occur right at FIA points, but in some negotiated location in association with them.

The FIA Program has been working with the WFWR staff on developing a the multi-species inventory and monitoring (MSIM) system in such a way that it can be overlaid on the FIA grid. This leverages the two programs by providing a consistent national framework and makes the vegetation data available to the wildlife monitoring process.

## MSIM integrates data layers to provide valuable analytical tools



Forest Inventory and Analysis  
*The Nation's Forest Census*

**Fast Fact:** There are currently 4.5 million tree records in the FIA online database

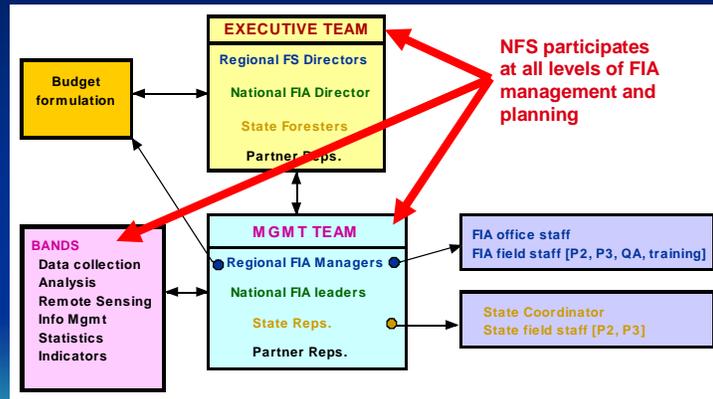
Why –

Information from multi-species surveys is combined with data from other sources, namely FIA, satellite imagery and GIS, to generate a comprehensive data set to address population and habitat trends. ^ All these data would be migrated into NRIS, the Natural Resource Information System, for long-term storage. For analysis, these data would be brought together in various formats to develop analyses of trends and the relationship between animals and habitat/landscape characteristics. ^ This then feeds in to an evaluation and adaptive management phase.

Two years of pilot study in NFS Region 5 have demonstrated feasibility to gather reliable information to detect population change of 50% of terrestrial wildlife species, including Management Indicator Species. The Protocol will be part of a Series published by EMC.

# FIA management structure

(includes National Forests and other partners by design)



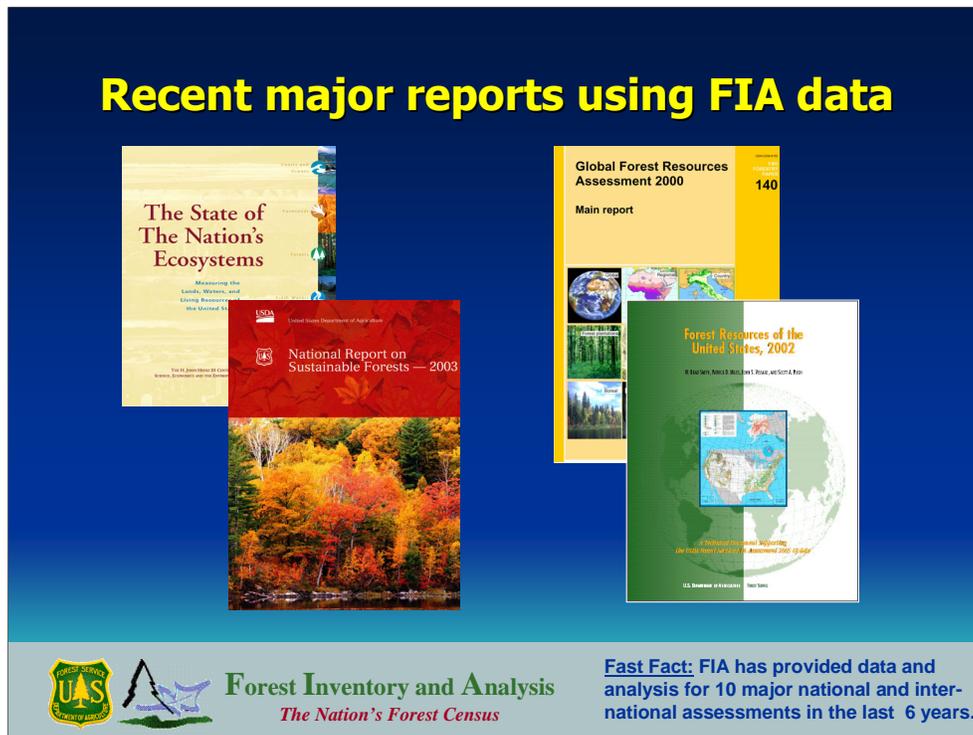
**Forest Inventory and Analysis**  
The Nation's Forest Census

**Fast Fact:** Annualized FIA includes over 200 million acres of U.S. forests with spatial or temporal sampling intensification at partner expense.

Realizing the critical role FIA can play in Forest Planning, the program's management structure includes representation and opportunities for active participation at all management levels from national to local.

These slides and text are intended to provide only a taste of the many ways that the partnership of FIA and National Forests Systems is growing and adding value to the Forest Service motto of "Caring for the Land and Serving the People".

## Recent major reports using FIA data



**Forest Inventory and Analysis**  
*The Nation's Forest Census*

**Fast Fact:** FIA has provided data and analysis for 10 major national and international assessments in the last 6 years.

FIA has provided critical leadership and input for 10 national and international assessments in the past 6 years. FIA can provide perspective data and analysis from a National Forest to the global scale.

The Heinz Center State of the Nations Ecosystems was released in 2002 and FIA supplied 10 of 18 forest indicators and analysis.

The 2003 National Report on Sustainable Forests was released in March 2003 and FIA provided leadership for Criteria 2 “Maintaining productive capacity of forest ecosystems” as well as 4 indicators in Criteria 1 “Maintaining biodiversity”.

Most recently the “Forest Resources of the United States, 2002”, the new RPA report is to be released by July 2004. This report will include a special CD with the entire national forest inventory assessment database. This CD provides the user with a tabular and graphic interface to the national data by Congressional District, ecoregion, watershed, State, and county.