1-What is FIA?

Forest Inventory Analysis (FIA) is a Forest Service program that inventories and analyzes public and private U.S. forests and their resources. Often called the Nation’s Forest Census, the FIA program is mandated by Congress to provide annual forest inventories at the State level. 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 nation’s trees and other forest vegetation are growing and how much has died, regenerated, or has been removed or planted. This information is used in many ways, such as guiding investment in natural resources, evaluating wildlife habitat conditions, assessing the sustainability of ecosystem management practices, and supporting planning and decision making activities undertaken by public and private enterprises.

Recently, the FIA program expanded to include the sampling of urban trees on all land use types in select cities. This differs from FIA’s traditional methods, which include the sampling of trees within urban settings but only on land that is considered “forest land” by FIA definitions. Recognizing the importance of including all urban trees and forests in the nation’s forest census, the Forest Service, together with state and local cooperators, is working towards a systematic approach for collecting and reporting data on the status and trends of urban trees and forests. This effort has led to the creation of the Urban FIA program.

For more information see the FIA program website.

2-What is i-Tree?

i-Tree is a state-of-the-art, peer-reviewed software suite from the USDA Forest Service that provides urban forestry analysis and benefits assessment tools. The i-Tree Tools help communities of all sizes strengthen their urban forest management and advocacy efforts by quantifying the structure of community trees and the environmental services that trees provide.

Since the initial release of the i-Tree Tools in August 2006, numerous communities, non-profit organizations, consultants, volunteers and students have used i-Tree to report on individual trees, parcels, neighborhoods, cities, and even entire states. By understanding the local, tangible ecosystem services that trees provide, i-Tree users can link urban forest management activities with environmental quality and community livability. Whether your interest is a single tree or an entire forest, i-Tree provides baseline data that you can use to demonstrate value and set priorities for more effective decision-making.

For more information visit the i-Tree website.
3-What is Urban FIA?

Urban FIA is a comprehensive, strategic level, continuous natural resources inventory and monitoring system designed to function on both public and private lands in an urban environment. It is not a one-time “snapshot” of our urban forests; it is a continuous inventory, measuring panels of plots annually so the data is constantly being refreshed. Urban FIA will complement existing regional and local urban efforts to provide a cohesive picture of urban forest conditions within census defined urban areas in the U.S. with a special emphasis on city-level data for each of the approximately 100 target (largest) cities in the nation. Although it has much in common with both the rural FIA program and i-Tree Eco methods and applications, Urban FIA is an independent program. Urban FIA is unique in that it is a product of collaboration and synergy between the rural focused FIA program and i-Tree, and it has benefited from lessons learned from past FIA urban inventory pilots. Urban FIA provides data of a known quality, a comparison of plots along the urban to rural gradient, tree merchantability and quality, insect and disease detection, and ecosystem services information.

4-How does Urban FIA define “urban forest?”

FIA uses the term “urban forest” broadly, to refer to the tree canopy cover of an urban area, including trees and tall shrubs. FIA uses the U.S. Census definition of “urban,” which includes urban areas and urban clusters (UAUC), to define urban areas.

5-Why is the Forest Service including urban forests in the FIA program?

The stewardship of the Nation’s rural forests is supported by a steady stream of comprehensive, consistent, and current information about forest health and condition, delivered annually by the Forest Service’s FIA program. Extending the FIA sampling frame to urban forests fills a critical information void and provides the same strategic resource information for urban forests as for rural forests. The expanded program will create a seamless forest inventory that spans the rural to urban gradient. Urban FIA will complement existing regional and local urban efforts to provide a cohesive picture of the urban forest conditions in the U.S.; which is in line with direction provided by the 2014 Farm Bill, instructing FIA to “implement an annualized inventory of trees in urban settings, including the status and trends of trees and forests, and assessments of their ecosystem services, values, health, and risk to pests and disease.”

6-Didn’t the FIA program already implement urban inventories in a number of states?

Yes - over the past several years the FIA program has piloted a number of statewide urban forest inventories, in partnership with U.S. Forest Service State & Private Forestry and state forestry agencies. These pilot studies demonstrated that the FIA system is capable of assessing and monitoring urban forests. While the statewide pilots provided a strategic, collective look at urban forests within a state, they were too coarse a sample to provide meaningful information to urban constituencies concerned about the urban forest of their city. The new Urban FIA framework has been designed with lessons learned from these state pilots. In contrast to the statewide approach of the pilots, the goal of Urban FIA is to build a strategic national inventory of urban forests one metro area at a time, with a special
emphasis on the major city within each metro area. This city-based approach will lead to a more comprehensive urban forest inventory for the nation.

7-When is the Forest Service going to begin Urban FIA, and where?

Urban FIA is already underway, beginning in and around the cities of Baltimore, Maryland and Austin, Texas. Field sampling began in Baltimore and Austin during the 2014 summer season.

8-Why were Baltimore and Austin chosen as the first Urban FIA cities? What cities are next?

Baltimore and Austin were selected as the first cities because of the Forest Service’s established relationships with the City of Baltimore and the State of Texas, and an expressed enthusiasm and willingness on behalf of these long-standing partners to collaborate and ensure the effort’s success. FIA’s work in Baltimore and Austin is helping to refine Urban FIA methodologies and reporting, and pave the way for the next cities. The program will continue in both Austin and Baltimore and has expanded into Milwaukee and Madison, Wisconsin; Houston, Texas; Des Moines, Iowa; Providence, Rhode Island; and St. Louis, Missouri.

9-When will Urban FIA data be collected in my city? How will I know?

The Urban FIA program is in a formative stage, starting with just a few metro areas, as the Forest Service builds and refines a robust methodology and reporting interface. The Forest Service expects the program to grow over time, as funding allows, metro area by metro area – with a focus on intensified sampling within the major city of each metro area. The best way to find out if and when the Forest Service is collecting Urban FIA data in your city is to check out our latest Urban FIA implementation map, or check with your State forestry agency and/or city urban forester. Interested in starting Urban FIA in your city soon? FIA is seeking partners and collaborators. Contact your regional FIA representative (see FAQ # 16) or your state forestry agency to learn opportunities to bring urban FIA to your city.

10-Do Urban FIA data help with local urban forestry efforts and municipal planning?

Absolutely. The program has been designed specifically to provide meaningful city-level data on the local level. Data from Urban FIA will provide strategic level, city wide data to city planners and elected officials to assist them in making budgetary decisions regarding future investments in their city’s urban forests. The program goes beyond a one-time “snapshot” of our urban forests - it is a continuous inventory, measuring panels of plots annually so the data is constantly being refreshed. The program is set up to measure a percentage of the plots associated with each study area each year; the number of years required to complete this process is referred to as cycle length. Urban FIA maintains the same cycle length as the rural FIA program in any individual state. For example, cities on a 7-year cycle will complete 1/7th of their plots each year and then start to re-measure the plots in year 8, when the cycle repeats. It is estimated that there may be preliminary data available after the first 3 or 4 years, and a summary report after the 7th year, as well as annual updates as new data become available. This new information about the city, coupled with base FIA sampling in surrounding urban and rural areas, will
provide a more comprehensive view of the forest at a regional and national scale, across an urban to rural gradient.

11-How does Urban FIA information differ from the i-Tree information I already have?

Some of the Urban FIA information is similar to i-Tree data that many cities already have. There are a few key differences:

The Urban FIA program collects the same basic data that the i-Tree program does as well as all the information that is normally collected within the rural FIA program, but on a 1/6-acre plot design instead of on a 1/10-acre plot design.

- i-Tree is a onetime “snapshot” of our urban forests and UFIA is a continuous inventory, measuring panels of plots annually so that data is constantly being refreshed. These permanent plots provide a continuous stream of consistent data providing a greater potential for change detection than the “snapshot” approach.
- Urban FIA has the ability to re-measure plots and trees so that meaningful trend data can be compiled and summarized.
- Urban wood utilization is growing. Urban FIA will provide traditional wood quality/volume and merchantability metrics to help inform wood utilization possibilities - something that hasn’t really existed before.
- Urban FIA will provide ecosystem services values on trees in both urban and rural areas.
- Our goal is to merge both the i-Tree and FIA processing systems, adding value to what both programs produce in terms of data outflows.
- As Urban FIA expands, there will be potential to look at regional or national trends in urban forests systematically, across all census-defined Urban Areas / Urban Clusters, not just cities that opted into the program.
- Urban FIA will seamlessly compare urban tree data with rural tree data.
- Urban FIA is supported by a rigorous certification and quality assurance process and all data is of a known quality.
- In the rural FIA program, only trees growing on forest land are measured. FIA defines “forest land” using several criteria—land has to be at least one acre in size, at least 120 feet wide, and have greater than 10% canopy cover, and the land cannot be developed for a nonforest use. The Urban FIA program, like i-Tree, includes the sampling of trees on all land, not just FIA-defined forest land. The Urban FIA program will keep forest land separate from urban forest land within the inventory.
- i-Tree assigns the dominant land use to a plot, while Urban FIA delineates each land use found on the plot into its own condition. Conditions are areas of like characteristics, such as forest type and land use. Urban FIA assigns both an i-Tree land use and an FIA land use to each condition.
- Urban FIA describes each tree tallied with one or more of the following descriptors: natural, planted, street tree, riparian tree, or maintained area tree. In addition, each tree is evaluated for any of the following seven common urban tree concerns: conflict with roots, conflict with crown, excessive mulch, improper planting, bark inclusion, improper pruning, and stem girdling.
- Urban FIA also includes all the basic i-Tree variables, which provide information on the traditional urban ecosystem services that i-Tree users are accustomed to using.
- Urban FIA tallies trees \( \leq 5" \) on the subplot and trees \( > 1" \) but \( < 5" \) on the microplots.
- Urban FIA program utilizes its **CORE tree list** as well as an **expanded urban tree list**.

**12-Are there economic benefits to having Urban FIA data?**

All trees provide benefits and services, regardless of where they are - trees sequester carbon, provide habitat, filter water, stabilize soils, provide biomass, enhance biodiversity, and help to improve economies; some trees also increase crop yields, protect livestock, conserve energy, improve public health and safety, and are utilized for food and timber products. These ecosystem services – a set of social, economic, and environmental benefits - can be quantified and valued. Urban FIA data will provide foundational information on our tree/forest resources, to increase understanding of the economic benefits provided and improve strategic planning and decision-making.

**13 – Should we continue to obtain i-Tree Eco data for our city, now that the Forest Service has initiated Urban FIA?**

It depends. Each city will need to evaluate its own unique circumstances and timeframes. The Urban FIA program will serve as the primary long-term urban forest monitoring program for the Nation’s census-defined urban areas; as well as its largest cities but, from a funding perspective, the program will not be active in all cities. It will take several years to build Urban FIA capacity to fully implement the program. i-Tree Eco will remain a viable means to obtain sound urban forest data while the Urban FIA program is expanding, especially for cities not initially included in Urban FIA. Please contact your regional FIA contact (see FAQ 16) to explore various options in order to find the best option for your city.

**14-How is the Urban FIA effort funded?**

The Urban FIA program was established in 2014 with initial funding from the Forest Service and direct and in-kind partner support for work in Austin, Texas, and Baltimore, Maryland. Expansion of the program will require long-term funding from both the Forest Service and additional partners.

**15-Is Urban FIA implementation a permanent, long-term component of the FIA program or is it a pilot program?**

Urban FIA is a permanent, long-term component of the FIA program.

**16-Who can I contact with my questions?**

For general and technical questions regarding the program:
- **Mark Majewsky**
  - mmajewsky@fs.fed.us
  - 651-261-0053
For information about getting Urban FIA started in your city:
Northern Region: Dennis May 651-649-5139
Southern Region: Bill Burkman 865-862-2000
Interior West region: Michael Wilson 801-625-5407
Pacific West region: Gretchen Nicholas 503-8082034

FARM BILL FAQs

1-How is the Forest Service responding to 2014 Farm Bill direction to include Urban FIA in its FIA strategic plan (Section 8301)?

Urban FIA is a key component of proposed revisions to the FIA strategic plan. The new strategic plan has been delivered to Congress in response to 2014 Farm Bill direction.

2-When will the FIA strategic plan be revised and where will I be able to find it?

We expect the new FIA strategic plan to be published in 2015. For additional information see a summary of the 2014 Farm Bill provisions for FIA and the draft plan, available here.

TECHNICAL FAQs

1-How do the Urban FIA process and method differ from other areas inventoried?

Urban FIA methods and procedures are similar to the FIA program’s treatment of rural forests, but customized for urban applications based on what we learned from previous FIA urban inventory pilots and our experiences working with i-Tree applications.

- In the rural FIA program, only trees growing in areas that meet FIA’s definition of forest land (1 acre in size, at least 120’ wide, >10% canopy cover, and not developed for a nonforest use) are measured, while the Urban FIA program samples trees on all land uses, not just forest land.
- Both programs divide the land that is coincident with their subplot(s) into conditions. Conditions are areas of like characteristic, such as forest type and land use. The rural program only defines the first non-forest condition encountered on the plot, while the Urban FIA program further describes multiple nonforest conditions if they are present.
- Urban FIA has an expanded list of land uses that it delineates.
- Urban FIA assigns each tree tallied with one or more of the following descriptors: natural, planted, street tree, riparian tree, or maintained area tree. In addition, each tree is evaluated for any of the following seven common urban tree concerns: conflict with roots, conflict with crown, excessive mulch, improper planting, bark inclusion, improper pruning, and stem girdling.
- Urban FIA includes all of the basic i-Tree variables, which provide information on the traditional urban ecosystem services that i-Tree users are accustomed to using.
- Although both programs use 1/6 acre samples, Urban FIA uses one 48’ fixed radius subplot while the rural FIA program uses four 24’ fixed radius subplots. This change was focused
on limiting the time required to contact multiple landowners to gain access to the plots. Urban Plot design diagrams can be found here.

- Urban FIA collects vegetation cover (trees / shrubs) and surface cover (permeable / non permeable) on the portion of each condition that is coincident with the subplot.

2-How will data collection from urban plots connect to FIA’s rural or non-urban data?

The FIA program will use the same base grid, or sampling frame, for both rural and urban inventories, allowing for an eventual seamless urban to rural gradient inventory. The new Urban FIA effort is filling in missing information on the base grid – this provides a comprehensive set of information about the nation’s forests and avoids any potential for double counting, such as for national carbon statistics.

3-How is an Urban FIA study area geographically defined?

The FIA program will define urban areas using nested U.S. Census Core Based Statistical Areas - CBSA’s (metropolitan areas) and Census defined urban areas and clusters (UAUC), together with city/places boundary files that will represent the city limits of the target cities.

4-How does the FIA program select urban inventory plots?

The FIA program utilizes a hexagonal sampling frame, selecting one sample for every 6,000 acres of land. This same sampling frame will be utilized to identify Urban FIA plots within all census-defined Urban Areas / Urban Clusters (UAUC) across the U.S.; as well as each target city’s (approximately 100 of the largest cities in the nation) Core Based Statistical Area - CBSA. All hexes within the Census defined UAUC within the CBSA will contain a plot location that is randomly selected within each hex. Hexagons within the target city boundary (city limits) will be intensified to a level resulting in about 200 plots. This sampling frame will record land-use and land cover information (including impervious surface) and measure vegetation if it exists, on all plots, even if there are no trees on the plot. A short slide show demonstrating the plot selection process in Baltimore can be found here.

5-What information does the Urban FIA program collect at each urban plot?

For a brief overview of the types of data collected go here. If you are looking for additional details go directly to the Urban FIA Field Guide.

6-Is pest detection factored into data collection and analysis?

Yes, Urban FIA will factor both pest detection and storm damage into data collection and analysis. Data collection will cover abiotic, insect, and pathogen damages such as wind, emerald ash borer, and cankers. Damages are treated as a composite variable. Up to three damaging agents are recorded per tree – a complete list of damage codes can be found here. Many damaging agents are host specific and their potential for damage could vary by region. In general, recorded damage is likely to:
1. Prevent the tree from surviving more than 1-2 years;
2. Reduce the growth of the tree in the near term; and/or
3. Negatively affect a tree’s marketable products (such as cubic or board-foot cull).

**7-Does Urban FIA data collection include storm damage?**

Yes, Urban FIA will factor both pest detection and storm damage into data collection and analysis. Data collection will cover abiotic, insect, and pathogen damages such as wind, emerald ash borer, and cankers. Damages are treated as a composite variable. Up to three damaging agents are recorded per tree – a complete list of damage codes can be found [here](#). Many damaging agents are host specific and their potential for damage could vary by region. In general, recorded damage is likely to prevent the tree from surviving more than 1-2 years, reduce the growth of the tree in the near term, and/or negatively affect a tree’s marketable products (such as cubic or board-foot cull).

**8-Are the urban plots on public and private land?**

Yes, both.

**9-Is every tree in the urban center measured?**

No, Urban FIA will not measure every tree within the city center. The Urban FIA program is a sample-based inventory. FIA will collect data from sample plots within the Census defined urban area and every tree on each plot will be measured.

**10-Who collects Urban FIA data?**

FIA, partner, and contract crews will collect Urban FIA data. As with the broader FIA program, all Urban FIA crews must be trained and certified, and must meet productivity and quality standards.

**11-Can non-FIA staff, such as, municipalities, private tree care companies, community groups, and students contribute data?**

Non-FIA staff can contribute data to the Urban FIA program if they are trained by FIA, pass certification, and meet FIA productivity and quality standards. At this time, the Forest Service does not have a means for non-FIA staff or “citizen scientists” to officially collect data for FIA use.

**12-How does the Urban FIA methodology utilize i-Tree - are the two linked?**

The Forest Service is working in close collaboration with i-Tree in order to unite Urban FIA and i-Tree methods, processing, and delivery systems. There are three main areas where the FIA and i-Tree methodologies are combined to form the new Urban FIA inventory: field methods, data processing, and publication. The combined field methodology of Urban FIA is designed to preserve all required variables for the traditional i-Tree compilation engine to run. It also includes most of the traditional FIA
field variables used by FIA’s compilation engine. However, the traditional FIA cluster plot design has been altered to allow for more efficient data collection in the urban environment. Urban FIA data processing will incorporate elements of both traditional/rural FIA and i-Tree compilation. For example, the condition proportioning and merchantable volume will be incorporated from the FIA tradition and net/gross carbon sequestration and Volatile Organic Compound (VOC) emissions estimates from the i-Tree tradition are included. The goal is to enable analysis of not only the urban environment under study, but the larger context (landscape) in which that urban area exists. By incorporating elements of both traditions it will be possible to analyze a suite of variables across the urban-to-rural gradient. The publication methodology will closely resemble the traditional FIA method of delivering a periodic comprehensive report and annual updates. Data (sanitized to protect actual owners and plot locations) will be available for download via an online DataMart. Initial versions of comprehensive Urban FIA reports and the DataMart will include the full suite of i-Tree data and limited FIA data. As the development of the Urban FIA database progresses, more FIA data will become available and urban FIA reports and data delivery will expand.

13-Does Urban FIA utilize remote sensing data?

Yes. Remote sensing is used for field logistics, sample stratification and population estimation, land use and cover calls, mapped products, and other needs – similar to FIA work in rural areas.

14-Where can I obtain technical information about Urban FIA data collection – is there an Urban FIA field guide?

Yes. You can download the current version of both the National and Regional Forest Service Urban FIA Field Guide, which is the best way to obtain technical information about Urban FIA.

DATA ACCESSIBILITY and ANALYSIS FAQs

1-Where will Urban FIA data be stored, and will everyone have access?

The Forest Service is planning a logical expansion of current FIA rural forest delivery systems to accommodate urban forest data. Urban data will be online and available to all via a DataMart that allows users to export the data to their own systems, including summary tables, and access periodic reports. Users will also be able to run custom queries using Urban FIA online tools.

2-Will the Forest Service analyze the data and provide key findings?

Yes, the Forest Service will analyze all Urban FIA data and provide comprehensive 5-year reports for each urban area, which will be updated online with annual data.

3-How often will Urban FIA data be updated?

Annually.
4-Will Urban FIA data help inform forest trends on a nationwide basis?

Yes. As the program expands to include the sampling of additional cities and their surrounding urban areas, we will build a body of data that will support the analysis of forest trends nationwide, across the urban to rural gradient, and will help fill a critical missing piece in the nation’s carbon accounting.