

Indiana Urban Forest Health Monitoring Pilot Test - Stage 1



Introduction



The implementation of the Forest Health Monitoring (FHM) Program by the USDA Forest Service has proven effective as a sampling method to assess and detect potential health issues within "traditional" forested areas. Given the success of this nationwide standardized program, a determination was made to encompass trees located within more populated areas. Randomly selected locations from FHM that fell within urban boundaries could be selected as urban forest plots. In 2001, Indiana was selected to conduct a pilot study for Urban Forest Health Monitoring (UFHM). The purpose of this pilot is to refine sampling techniques, data collection procedures, determine validity of data and address complications encountered when utilizing the FHM sample framework in urban environments. This poster presents information on the pilot project.

Why Urban Forest Health Monitoring?



The national FHM survey locates forested plots across the country to collect data on the health of the forest. However, the FHM survey design presently excludes plots that are defined as urban and no data is collected. As a significant national resource and key component of environmental health, the contributions of our urban forests are becoming increasingly vital as urban sprawl escalates. Indiana's total population increased 9.7% from 1990 to 2000 and now ranks 14th in the nation. With Indiana's urban forest estimated at 78 million trees, the stresses of population growth and associated land development plus municipal budget constraints jeopardize the longevity & health of urban forests. Data collected from urban plots could identify trends detrimental to the health of urban forest ecosystems and generate data to assess diversity & variability of urban forests across the state or region.

Objectives

The purpose of pilot is to refine sampling techniques, data collection procedures, determine validity of data and address complications encountered when utilizing the FHM sample framework in urban environments. Steps of the pilot are:

- Overlay of census defined urban areas
- Select plots falling within urban areas
- Identify non-forest plots
- Modify and document Core Field Guide
- Field crew training
- Plot data collection
- Analysis

Datasheets

Methods

The pilot project used the methods of FHM to collect data and used the FHM subplot design (or FHM 'Footprint') to establish each plot. The methods were modified by NOT collecting data for the FHM indicators – soils, downed woody debris and vegetation.

The tree data measurements for crowns and damage were collected following FHM guides. Added to the tree data collected was the distance to buildings.

The microplots are measured following FHM guides, except seedling and sapling data is not collected. The crown measurement – foliage density – was added to the FHM crown measures of crown density, foliage transparency, diaphanous and live crown ratio.

Data not collected by FHM, but added for this pilot project is subplot data related to the percent of the subplot covered by grass, cement, buildings and other variables.

Using Forest Inventory and Analysis (FIA) survey points and the urban areas as defined by the U.S. census, 29 phase 2 FIA plots from the sampling panel for 2001 were identified and used to conduct the pilot project. The plots are located across 13 counties and 22 cities. Each plot represents 160,000 acres. Plot installation began in June and continues through the present time. Plot installation initiated with the determination of the center location of the central subplot using fixed definable references from scaled aerial photos. Landowner permissions for property access were granted through personal contacts. Data collection occurred during the leaf-on window of June to September, 2001 and will resume in the 2002 leaf-on window.

Datasheets were created and all data was recorded on paper in the field by a two person crew and transferred in the office to an Access database designed by the pilot project.

Results



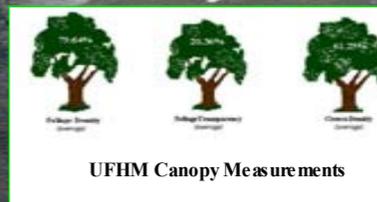
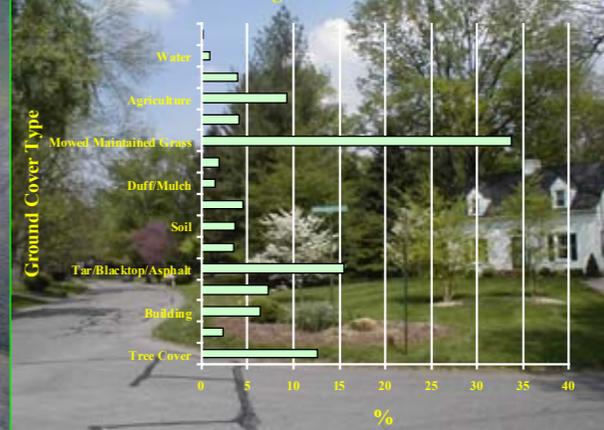
- 41.6% (10) of the installed plots (24) contained 1 or more trees
- The average DBH is 14.36" while average length is 40.93'
- 30.95% (13) of the trees were coded for damage
- Plots landed in a variety of industrial areas, subdivisions, agriculture fields, parks, buildings/objects
- Field work hindered by number of landowner contacts/permissions and structural obstacles, as a result there are a number of incomplete plots that need to be revisited to complete dataset for panel 1
- Ground cover consisted mostly of mowed grass (33.179%) and Tar/Blacktop/asphalt (15.53%)
- 35.71% of the trees recorded were located at least 60' from a building
- Database was developed for organization & analysis of data using Microsoft Access

Discussion



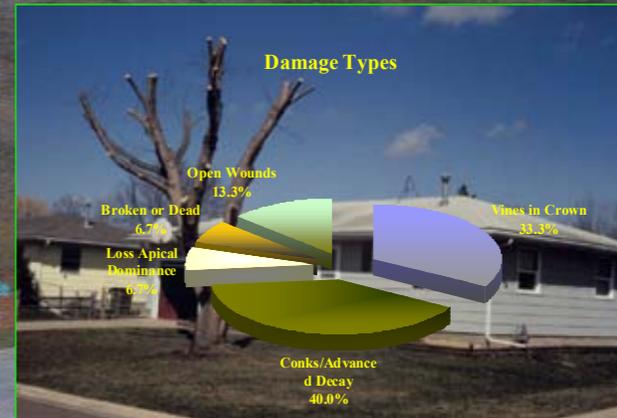
Pilot test work to date raised concerns for collection methods and other survey procedures, such as foliage density, building variables, lack of trees on plots, survey logistics, multiple landowner contacts, microplot data, and an absence of variables related to urban tree issues. The higher number of landowner contacts increases the probability of denied/delayed access to plot locations each cycle. As a result, we need to revisit plots for completion. Urban trees are subjected a number of non-traditional origins of damage and scenarios that contribute to their decline in health and vigor. The variables recorded should address issues prominent in urban areas such as confined space (roots, crown), topping, improper planting, soil compaction, volume & grade. The current variables recorded do not address these damages and scenarios. The pilot project will make recommendations regarding the need to change or add variables after completion of the data collection for panel 1. Recommendations will also be made on cost, personnel, equipment and resources required for yearly UFHM sampling using this framework.

Average % Ground Cover



UFHM Canopy Measurements

Damage Types



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