

FOREST INVENTORY AND ANALYSIS

NORTHEAST CORE FIELD GUIDE

Version 1.7

1.000 INTRODUCTION

This document describes standards, codes, methods, and definitions for the Annual Forest Inventory field data collection procedures to be carried out in the Northeast. Supplementary instructions will be issued as needed.

The National Forest Inventory and Analysis Field Guide -- Federal legislation mandates that annual inventories and periodic assessments be made of the Nation's forests. The units of the National Forest Inventory and Analysis Program (FIA) are in the process of revising the field instructions for data collection. The objective is to describe core FIA field procedures that will be consistent and uniform across all FIA units. **This core serves as the framework for regional FIA programs; individual programs may add variables, but may not change the core requirements.** This document is a combination of national core variables and regional variables of interest to the clients and customers of the FIA unit at the Northeastern Research Station. Unless otherwise noted, these items are considered CORE, that is, all FIA Units and cooperators, as specified, will collect the information. It is expected that a two-person field crew can measure all items in this guide (Version 1.7) in less than a single day, on average, including time spent traveling to and from the plot.

The FIA program is in transition, changing in response to legislation and new customer demands. One of these demands is for increased consistency, which this manual begins to address. Another change will be integration of the FIA program with the plot component of the Forest Health Monitoring (FHM) program. This will be accomplished by a joint sampling approach where FHM plots become a subset of the larger sample of FIA plots. In this model, plots formerly known as FIA plots will now be called Phase 2 plots; plots formerly known as FHM plots will be called Phase 3 plots.

FIELD GUIDE LAYOUT

Each chapter of the field guide corresponds to one of the following:

- 1.000 Introduction
- 2.000 Plot Establishment
- 3.000 Plot Data
- 4.000 Condition, Boundary and Subplot Data
- 5.000 Seedling Data
- 6.000 Tree Data
- 7.000 Site Tree Data
- 8.000 Ownership Data
- 9.000 Nonforest / Access Denied / Hazardous / Water Plots
- + Appendices 1 - 12

Each chapter or section begins with some general overview of the data elements collected, along with whatever technical background is necessary to prepare the field crews for data collection. Descriptions of data elements follow, in the following format:

DATA ELEMENT NAME -- <brief variable description>

When collected: <when data element is recorded>

Field width: <X digits>

Tolerance: <range of measurement that is acceptable>

MQO: <measurement quality objective>

Values: <legal values for coded variables>

Data elements and descriptions of when to collect, field width, tolerances, MQOs, and values, apply to both Phase 2 plots (formerly called FIA plots) and Phase 3 plots (formerly called FHM plots) unless specifically noted.

Field width designates the number of columns (or spaces) needed to properly record the data element.

Tolerances may be stated in \pm terms or a number of classes for ordered categorical data elements (e.g., ± 2 classes); in absolute terms for some continuous variables (e.g., ± 0.2 inches); or in terms of percent of the value of the data element (e.g., $\pm 10\%$ of the value). For some data elements, no errors are tolerated (e.g., PLOT NUMBER).

MQOs state the percentage of time when the collected data are required to be within tolerance. Percentage of time within tolerance is generally expressed as "at least X percent of the time," meaning that crews are expected to be within tolerance at least X percent of the time.

UNITS OF MEASURE

The primary measurement unit system is English. Data will be collected in the field with English tools and instruments, and recorded in English.

Tree Limiting Dimensions:

breast height	4.5 ft.
stump height	1.0 ft.
merchantable top	4.0 in.
minimum seedling length - softwoods	0.5 ft.
minimum seedling length - hardwoods	1.0 ft.
seedling/sapling DBH break	1.0 in.
sapling/tree DBH break	5.0 in.
softwood large/medium DBH break	9.0 in.
hardwood large/medium DBH break	11.0 in.

Plot Dimensions:

Annular plot -- for sample intensification or sampling relatively rare events.

Radius = 59.0 ft.

Area = 10,935.88 sq. ft. or 0.25 ac.

Subplot - for selecting trees with diameter \geq 5.0 in.

Radius = 24.0 ft.

Area = 1,809.56 sq. ft. or 0.04 ac.

Microplot - for selecting seedlings and saplings

Radius = 6.8 ft.

Area = 145.27 sq. ft. or 0.003 ac.

The distance between subplot centers is 120.0 ft.

The distance between subplot and microplot center is 12.0 ft.

The minimum area needed to qualify as forest land is 1.0 acre.

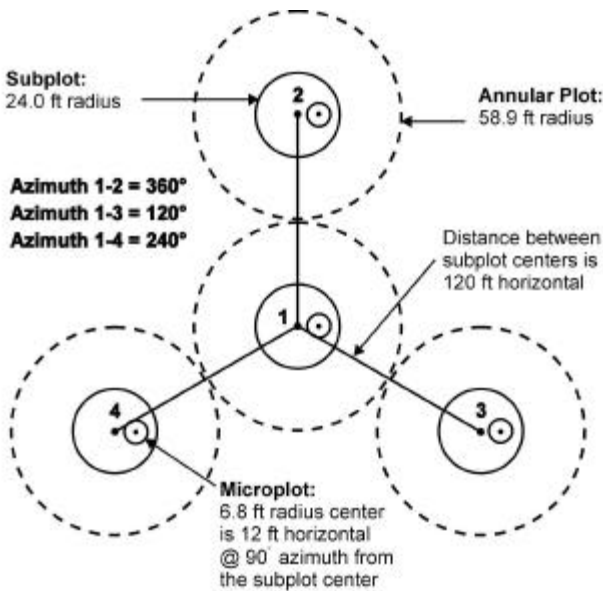
The minimum width to qualify as forestland is 120.0 ft.

GENERAL DESCRIPTION

The CORE field plot consists of four subplots approximately 1/24 ac. with 24.0 ft. radius. The center subplot is subplot 1. Subplots 2, 3, and 4 are located 120.0 ft. at azimuths of 360°, 120°, and 240° from the center of subplot 1. Subplots are used to collect data on trees with a diameter at breast height (DBH) of 5.0 in., or greater. Throughout this manual, use of the word "plot" refers to the entire set of four subplots. "Plot Center" is defined as the center of subplot 1.

Each subplot contains a microplot of approximately 1/300 ac. with radius 6.8 ft. The center of the microplot is offset 90° and 12.0 ft. from plot center. Microplots are numbered in the same way as subplots. Microplots are used to select and collect data on saplings (DBH of 1.0 in to 4.9 in) and seedlings (DBH less than 1.0 inch in diameter and greater than 0.5 ft in length (conifers) or greater than 1.0 ft in length (hardwoods)).

As a CORE OPTION, the field plot may also include annular plots of approximately 1/4 acre with radius 59.0 ft. The center of an annular plot coincides with the center of the respective subplot. Annular plots are numbered in the same way as subplots. Annular plots may be used to select and collect additional data for regional enhancements, for example to provide a better sample of rare population elements.

**FIA National Plot Design**

Data are collected on each field plot at the following levels:

Plot	Data that describe the entire cluster of four subplots.
Condition	A discrete combination of landscape attributes that describe the environment on all or part of the plot. Examples of such attributes include condition class status, land use, forest type, stand size, stand origin, owner group, reserve status, and stand density.
Boundary	An approximate description of the demarcation line between two condition classes that occur on a single subplot, microplot, or annular plot. There is no boundary recorded when the demarcation occurs beyond the fixed radius plots.
Subplot	Data that describe a single subplot of a cluster.
Seedling	Data describing trees with a diameter < 1.0 inch and ≥ 0.5 ft in length (conifers) or ≥ 1.0 ft in length (hardwoods).
Tree	Data describing saplings with diameter 1.0 in. to 4.9 in. and ≥ 4.5 ft in length; and trees with diameter ≥ 5.0 in. and ≥ 4.5 ft in length
Site Tree	Data describing site trees.
Ownership	Data identifying owner at plot center of subplot 1.

PLOT INTEGRITY

Each FIA program is responsible for minimizing damage to current or prospective sample trees and for specifying how these trees are monumented for remeasurement. The following field procedures are permitted:

- Scribing and nailing tags on witness trees so that subplot centers can be relocated.
- Nailing, tagging or painting of trees on microplots, subplots, and annular plots so that these trees can be identified and relocated efficiently and positively at times of remeasurement.
- Nailing, scribing, or painting microplot, subplot, and annular plot trees so that the point of diameter measurement can be accurately relocated and remeasured.

All other potentially damaging procedures that may erode plot integrity are prohibited. The following practices are specifically prohibited:

- Boring of trees for age on subplots and to determine tree age, site index, stand age, or for other reasons. (Northeastern States only)
- Boring and scribing of some specific tree species on the subplot, such as quaking aspen, that may cause adverse affects to the entire plot area (i.e., the initiation of infection or callusing)
- Chopping vines from tally trees. When possible, vines should be pried off trunks to enable accurate measure. If this is not possible, alternative tools (calipers, Biltmore sticks) should be used.

5 PANEL CYCLE

The Annual Forest Inventory is based on a five-year cycle. Each year within the cycle is called a “panel.” A panel consists of twenty percent of all sample plots within the five or seven year cycle. Field crews will be provided with the maps, photos, old tally sheets, and other records necessary to locate or establish the sample plots within each panel.

The majority of the sample plots that will be established during this inventory will be on land owned by private individuals and corporations. The cooperation of these individuals and companies is vital to the success of this inventory and subsequent inventories. In order to maintain the level of trust that has been developed with these cooperators, all employees involved in any phase of data collection are directed to make a reasonable attempt to contact the property owner and obtain their permission to establish or visit a plot.

Furthermore, permission must be obtained if the property is posted against trespass. This includes additional posted ownerships that must be crossed during the process of reaching the sample plot.