



Discussion of Phases 1, 2, and 3



FIA Demonstration Plot at SAF Headquarters - Bethesda, MD

Phase 1:

Phase 1 is the aspect of data collection related to remote sensing. We conduct this activity in the office. Current methods rely on aerial photographs:

- A Phase 1 "photo point" is evaluated for approximately every 240 acres.
- Each "photo point" is characterized as forest or nonforest.
- A subset of the photo points are selected for field data collection (Phase 2).
- A subset of photo points are also ground checked by the field crews during the Phase 2 data collection. It is from these ground checks of Phase 1 "photo points" that the forest/nonforest proportions are corrected to use in data processing.

We are currently changing from aerial photographs to satellite imagery for doing Phase 1 stratification.

Phase 2:

Phase 2 is the field data collection activity. The field plots are selected systematically regardless of whether they are forest or nonforest in Phase 1. Forested plots are installed and measured regardless of intended use or any restrictive management policy. Plots are also installed on all ownerships after permission is granted by the landowner. It is on these field locations that the majority of data collection activities occurs.

- All tree measurements such as diameter, height, damage, cull, and grade;
- Counts of tree regeneration;
- General land use is determined on all plots.
- On forested plots, general stand characteristics are also collected such as forest type, stand age, and disturbance.
- By remeasuring plots from the previous time frame, estimates of growth, mortality, and regeneration are made at both the tree and plot level.
- Changes in land use and general stand characteristics are determined by revisiting plots from the previous time period.

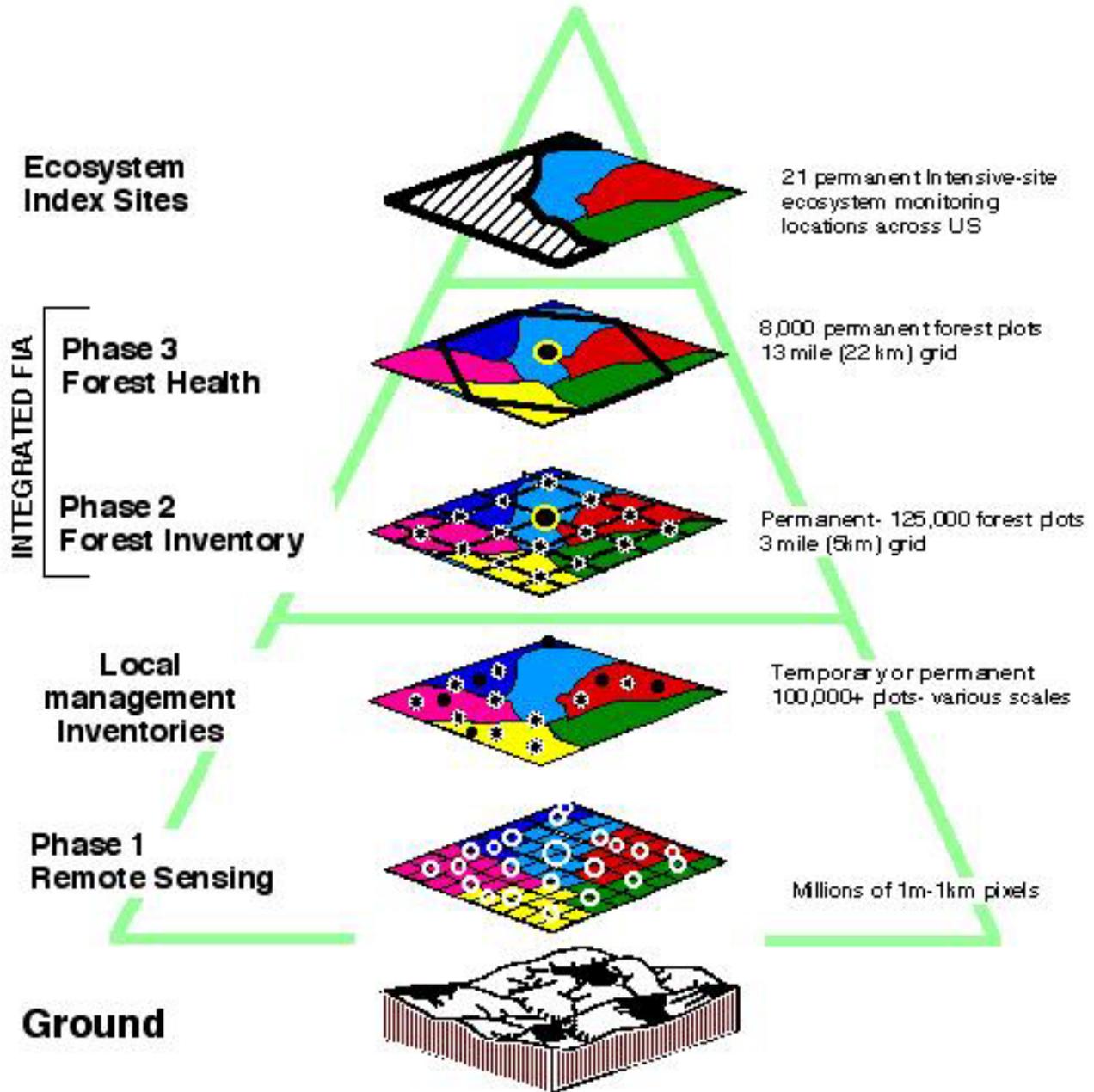
Phase 3:

On a subset of the Phase 2 plots, we collect a more extensive set of data. These measures relate to forest ecosystem function, condition, and health. Due to the seasonality associated with some of these measurements, the Phase 3 data are generally collected during a three-month window - June, July, and August. The current measurements on the Phase 3 subset of plots can be grouped into the following categories:

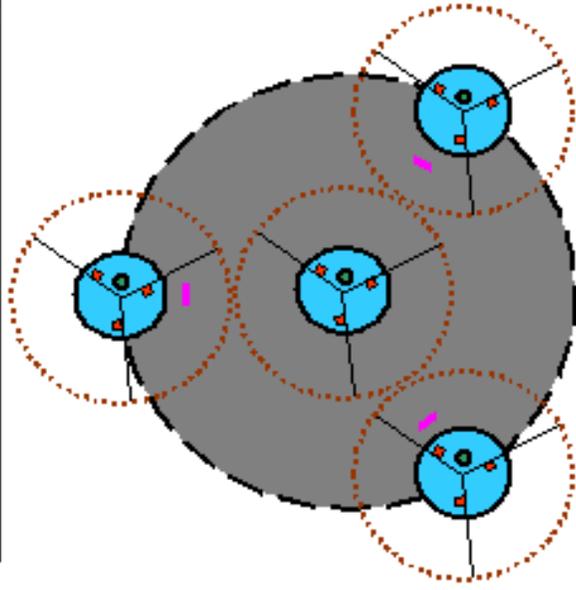
- **Crown Conditions** - generally poor crown conditions are symptoms of trees under stress and trees with good crown conditions are vigorous.
- **Soil Erosion Potential** - estimates of soil erosion potential help identify areas that may contribute to water quality degradation.
- **Soil Chemical Analyses** - collection of and analysis of soil samples include estimates of site fertility and in some cases potential toxicity relating to acidic soils that relate to productivity.
- **Lichen Communities** - the presence or absence of certain lichen species is indicative of air quality and climate changes.
- **Ozone Bioindicator Plants** - are plants with known sensitivities to ground-level ozone, although not necessarily collected on the Phase 3 plots (this effort can occur in the general plot area).
- **Vegetation Structure** - is the composition of vegetation (species and growth forms), abundance, and spatial arrangement in the forest. Also the presence of exotic and introduced plant species can be extracted from the collected data.
- **Down Woody Debris** - this measurement is useful in determining fire fuel potential and this information with the vegetation structure data can be used in wildlife habitat models.



USDA Forest Service Integrated Monitoring Framework



Phase 2/Phase 3 Plot Design



● Subplot	24.0 ft (7.32 m) radius
● Microplot	6.8 ft (2.07 m) radius
○ Annular plot	58.9 ft (17.95 m) radius
● Lichens plot	120.0 ft (36.60 m) radius
■ Vegetation plot	1.0 m ² area
■ Soil Sampling Area	
— Down Woody Debris Transect	60.0 ft (18.30 m)

General plot and stand descriptive data is collected on various portions of the plot. Also ozone bioindicator plant data is collected at or adjacent to the plot.

The **subplot** is where the basic tree measurements (with a DBH of 5.0 inches and greater) are collected including growth, mortality, and quality measures of the tree for use. This is also the location for all of the crown condition and damage symptoms for each tree that relate to tree health.

Information relating to regeneration is collected on this part of the **microplot**. Regeneration data relates to trees with a DBH less than 5.0 inches, seedlings and saplings.

The **annular plot** is used to sample rare events. In the western US it is used for collecting data on trees with a DBH greater than 40 inches.

The lichen communities data collection occurs on the lichen plot portion. Lichen communities data provide information for biodiversity and also relate to air quality.

The **vegetation plots** are used to identify all vegetation to the species level and also the height zone that the species occupies in the stand. Information on exotic or introduced plants can be extracted from the species list from each plot. The vegetation height zone data can be used for wildlife habitat models.

Soil samples are collected on the **soil sampling area** of the plot. The samples are analyzed in a laboratory for basic soil nutrient parameters, pH, and soil aluminum. Other descriptive information such as slope % and length of slope which are used to estimate potential soil erosion are collected on the subplots.

The down woody debris transects (line samples) are used to gather information on trees and tree branches. This data can be used to assess fire fuel loading potential and down woody debris is useful for wildlife habitat.