



Detection Monitoring

Detection Monitoring (DM) is the most extensive of three monitoring activities in Forest Health Monitoring (FHM). It is designed to provide data to determine baseline or current conditions of forest ecosystems, and detect changes and trends over time. This information is analyzed to determine if detected changes are anticipated, and if those changes indicate forest health.

Monitoring the health of forest ecosystems requires an integrated approach at multiple scales utilizing a variety of tools from satellites and aircraft to ground-based measurements and surveys.

Remote sensing utilizing satellite sensors is an effective way to detect changes in forest cover, fragmentation, and land use at regional scales. Airborne hyper spectral scanners and classical aerial photography can provide useful information regarding tree damage distribution on a landscape scale.

Aerial detection surveys are widely used for collecting data on biotic and abiotic damage to forested ecosystems. Forest Health Protection (FHP) and its many State and Federal cooperating partners have been conducting aerial surveys in some areas, for over 50 years. These provide annual information on insect, disease, and weather related damage. The information is used for regional and national reporting on insect and disease conditions and trends. Aerial detection survey data are used by forest land managers, the public, and government officials. The FHM program uses this data to evaluate tree damage that may be missed on periodically visited ground plots. To better serve all our customers, FHP and FHM have been working together to ensure that more consistent data are collected, national historical records are maintained, and that data standards and quality assurance procedures are developed and implemented among the states and FS Regions/Area. Many cooperators are now using automated digital sketch mapping systems that link to aircraft global positioning systems.

Ground plots for monitoring forest health indicators have been a critical component of the FHM program since its inception. They provide information on a



An aerial survey specialist uses the recently developed Digital Aerial Sketch Mapping System in a single-engine aircraft. This form of remote sensing provides for direct recording of sketched features on a moving map display into a GIS environment.

broad suite of forest health indicators. Since 1999, FHM ground plots have been integrated into the ground plot network maintained by the Forest Inventory and Analysis program.

Invasive species detection. Monitoring for invasive plant, insects, and diseases is fast becoming a large part of DM efforts. Once the most dangerous potentially invasive pests are identified, early detection programs are implemented to find incipient invasions before they have the opportunity to spread. A risk-based approach is used incorporating knowledge of pest biology, susceptible hosts, suitable environment, and likely pathways of introduction to identify high-risk areas for invasions. Sampling protocols are developed for cooperative surveys targeting specific invasive pests involving federal, state, and local partners. Public information is disseminated to encourage reporting of suspected invasive pests and developed information management systems facilitate the rapid sharing of detection monitoring results.

DM data are used in local, State, regional and national assessments of forest condition. The goal is to integrate all scales of monitoring so that a more complete picture of forest health is possible.

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