

TITLE: INT-F-06-01 Monitoring the condition of aspen in the Northern and Intermountain Regions

LOCATION: Northern and Intermountain Regions including the states of Montana, Idaho, Nevada, Utah, and Wyoming

DURATION: Year 1 of a 3 year project **FUNDING SOURCE:** Fire Plan

PROJECT LEADERS: John C. Guyon II, James T. Hoffman, Marcus B. Jackson, Plant Pathologists with Forest Health Protection, Northern and Intermountain Regions

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PROJECT OBJECTIVES:

1. To quantify the extent and severity of aspen decline and mortality through an extensive system of plots throughout aspen forest types in the Intermountain and Northern Regions.
2. Describe forest conditions associated with both high and low levels of aspen decline and mortality.
3. To quantify and describe the insect, disease and stand related factors associated with both stable and unstable aspen clones.
4. To determine if some aspen dieback events lead to successful regeneration by aspen clones, and the conditions present in clones that are not successfully regenerating.

JUSTIFICATION:

The proposed monitoring project is closely tied to high priority goals with the National Fire Plan, in fact the first paragraph of the description of the National Fire Plan on the Fire Plan website states:

“Though wildland fires play an integral role in many forest and rangeland ecosystems, decades of efforts directed at extinguishing every fire that burned on public lands have disrupted the natural fire regimes that once existed.” This research will directly address impacts of fire exclusion mentioned above on aspen forest types.

The primary reasons this monitoring project needs to be conducted now are:

1. Recent aerial detection surveys have documented dieback and/or decline in aspen clones in several areas in the Intermountain and Northern Regions. The cause of this dieback/decline has not yet been determined.
2. Published data from the Forest Health Monitoring plot system has also documented the decline of aspen and a report on this decline calls for additional plots and assessment of the extent and severity of this decline. (Rodgers, 2002)
3. This project addresses several FHM goals including: the impact of fire exclusion, the impact of drought, and causes of tree and clone mortality.

Severity, Extent and Cause

Aspen is the most widely distributed tree species in North America, and aspen has been frequently used as a keystone ecological indicator of forest health and ecosystem integrity. Aspen's primary means of regeneration is through root sucker sprouting from existing clonal root systems. Generally, disturbance or dieback is necessary to stimulate regeneration of aspen clones. The primary disturbance agent historically associated with aspen regeneration is fire. This fire-driven disturbance pattern has been disrupted by fire suppression and ungulate browsing frequently removes what suckers are present and hampers treatments intended to regenerate aspen. Aspen regeneration events from seed are quite rare and many aspen clones now present throughout the west have likely survived thousands of years. Existing conditions indicate that most aspen clones and stands will eventually be replaced by conifers or various shrub communities.

Communities of aspen are deteriorating throughout western North America, and high levels of tree and clone mortality have been documented in a wide range of areas throughout the West. This deterioration represents a monumental loss of ecosystem and vegetative diversity, as well as loss of forage of domestic livestock, habitat for wildlife, downstream water availability, and esthetic resources.

In the Intermountain and Northern Regions, all forests including aspen forest have and are experiencing several years of stress due to drought. This drought is likely to impact aspen forest particularly heavily because aspen often occupies the ecotones in between forest and brush vegetation types that are better adapted to drought stress.

This project was generated in part by reporting derived from FIA/FHM data, aerial survey, and other ecosystem monitoring efforts in Arizona. We will work closely with the FIA/FHM staff to assure that the locations of the plots we install will work to enhance the FIA/FHM grid while taking additional data that can't be derived from FHM/FIA plots.

Feasibility:

This project will be conducted using methods that have been field tested in other areas using well-established mensurational techniques. The project proposal will be reviewed by experienced researchers in the USDA Forest Service. The project will be implemented by experienced Forest Health Protection pathologists. Interest in aspen decline is currently at very high levels as shown by recent symposiums and monitoring throughout the West, and we are very committed to obtaining the best possible information for our clients and partners.

Methods:

This project will use methods that have already been field tested by the Evaluation monitoring project INT-EM-03 with minimal modification. The plot system will further clarify information derived from the FIA/FHM plots by providing more detailed information on how aspen clones are being impacted by current stand conditions and insects and diseases. We will first use the FIA/FHM data to detect which areas show some evidence of decline, and then establish a randomly co-located grid of plots based on GPS locations of the FIA/FHM plots.

1. Plots will be 1/20th acre, fixed-radius (26.33 foot diameter). Plot centers will be permanently marked and the location will be recorded with a GPS receiver. Individual live trees over 5" DBH will be tagged and measured with standard mensurational equipment.

2. Data will be recorded on all trees including: tree species, DBH, crown class, tree condition, and damaging agents and their severity.
3. Year of death will be determined or estimated.
4. Site characteristics will be recorded such as slope, aspect, elevation, exposure.
5. For the trees less than 5" DBH, a 1/100th acre sub-plot will be established to record regeneration characteristics.

Products:

Evaluation monitoring reports will be shared with forest managers on the condition of the aspen resource in the area surveyed as well as the extent, cause and severity of aspen decline and dieback. This information will also be shared with our partners in federal, state, and tribal agencies and other interested people. Yearly accomplishment reports will be presented to the FHM coordinators and presented to the annual FHM meeting.

Schedule of Activities:

We are proposing a three-year evaluation. In the first year we will concentrate on the southern most portion of the area to be surveyed and establish plots in Utah and Nevada. In subsequent years, we will move to the states of Idaho, western Wyoming, and Montana and any gaps that exist in the area sampled.

Costs:

| | Item | Requested FHM EM Funding | Other-Source Funding | Source |
|----------------|-----------|--------------------------|----------------------|----------|
| Year 1 | | | | |
| Administration | Salary | 20,000 | 15,000 | FHP Base |
| | Overhead | | | |
| | Travel | 8,000 | 3,000 | FHP Base |
| | | | | |
| Procurements | Equipment | 4,000 | | |
| | Supplies | 2,000 | | |
| | | | | |
| Total, Year 1 | | 34,000 | 18,000 | |

Year 2 and 3 will have similar budget requests

References

Rodgers, Paul, 2002. Using Forest Health Monitoring to assess aspen forest cover change in the southern Rockies ecoregion. *Forest Ecology and Management* 155:223-236.

