

Number: INT-EM-03-02

Title: Impacts to Aspen Communities in Northern Arizona.

LOCATION: Northern Arizona

DURATION: Year 2 of 3-year project **FUNDING SOURCE:** Base

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PROJECT OBJECTIVES:

- Quantify the extent and severity of decline and mortality of aspen at the stand level through an extensive plot network on a portion of Northern Arizona National Forests.
- Describe the forest conditions in areas that have experienced low to high levels of dieback and mortality induced by drought, pathogens and insects.
- Look for correlations between stand and site conditions and aspen mortality.

JUSTIFICATION: Aerial and ground detection surveys have determined a decline in aspen clones across northern Arizona over the past few years. Affected areas have a combination of symptoms including reduced canopy, branch dieback and mortality. Forest managers have recognized aspen communities as a critical element within the forests of Region 3, which have been in a gradual state of decline over the past 50 years. However, the accelerated decline occurring since 1999 is alarming. It appears that many affected areas are associated with poor site quality and defoliation by a severe frost event that occurred in early June of 1999. Compounding the decline is ungulate browsing of suckers, which has prevented successful regeneration of aspen across the region where both elk and aspen occur. The proposed monitoring project will help quantify aspen decline and mortality levels and describe site-specific stand and site variables that are influencing this event.

DESCRIPTION:

a. Background: Region 3 forest managers have discussed a decline in aspen communities for decades, after it was reported that the acreage of aspen dominated forests declined from nearly 500,000 acres to 263,000 acres between 1962 and 1986. Arizona is believed to have just twenty-five percent of those acres. This decline has been associated with two main factors: the absence of fire in southwestern ecosystems since European settlement, and extreme browsing pressure from large ungulates. An even more accelerated rate of decline has been observed across the northern half of Arizona over the past 3 years, following a severe frost event and several years of drought. Although aerial detection survey results report on the change in defoliation of aspen at a broad level, the extent and severity of the decline and mortality at the local and stand level is not known.

b. Methods: This project represents an intensification of the Forest Health Monitoring program permanent plots by providing finer resolution into specific aspen forest types and how growth and structure has been impacted by the drought and other related mortality factors. Areas with aspen decline and mortality are randomly selected using the off-plot aerial detection survey data. A grid of permanent plots is established across an affected area.

1. Plots are 1/20th acre fixed radius (26.33 feet radius). Plot center is marked with a piece of painted rebar and recorded with a GPS unit. Individual live trees are tagged. Logger tapes are used to determine "in" trees greater than 5 inches dbh.
2. Mensurational information is recorded on all trees, including: tree species, diameter at breast height (except juniper) or root collar (juniper), crown class, tree condition and damaging agent and severity (which included % expected crown foliage).
3. Year death is recorded as 2003, 2002, 2001, or greater than 2 years.
4. Site characteristics are recorded for each plot, including: aspect, slope, and elevation.
5. The species, number and type of regeneration, including saplings, is collected on a sub-plot of 1/100th of an acre located at plot center.

c. Products: Evaluation monitoring and technical reports will be sent to Northern Arizona forest managers and planners on the extent and severity of aspen decline, mortality, and regeneration success. This information will also be useful for agencies outside the Forest Service, i.e. State Lands Department, AZ Fish and Game, Bureau of Indian Affairs, National Park Service, Bureau of Land Management as well as the numerous mountain communities that are concerned with aspen forests.

d. Schedule of Activities:

Year 2. Establish permanent plots on an additional Forest/Reservation in eastern Arizona. Revisit and collect additional impact data on year 1 plots. Analyze new data and complete progress report with initial findings and any trend information.

Year 3. Revisit all plots and to collect subsequent impact data. Complete final analysis and report.

e. Progress Statement:

Eighty permanent plots were established in 9 randomly located sites on the Coconino National Forest in 2003. These were revisited in 2004 and over sixty more plots were established in 9 randomly located sites on Apache-Sitgreaves National Forest. Well over 2,000 aspen trees are now part of the data set for this project. A diversity of aspen communities is represented. Plots are laid out on a grid dispersed throughout an affected area.

Data entry and preliminary analysis of the Coconino plots occurred during the winter of 2003-2004 and was presented at this years Forest Health Monitoring Working Group meeting in Sedona, AZ. Preliminary analysis of the Apache-Sitgreaves plot data will be done the winter of 2004-2005 and the poster presented at the next FHM working group meeting. Present this preliminary information at Managing Aspen in Western Landscapes Conference in Utah in September, 2004.

COSTS:

	Item	Requested FHM EM Funding	Other- Source Funding	Source
YEAR 3				
Administration	Salary	10,000	5,000	FHP Base
	Overhead			
	Travel	4,000	1,000	FHP Base
Procurements	Contracting			
	Equipment	2,000		
	Supplies			
Total, Year 3		16,000	11,000	

