

2009



Colorado Forest Health Highlights

Forest & Non-traditional Forest Resources:

Forest Inventory & Analysis (FIA) studies estimate that Colorado has about 22.7 million acres of traditional forests with large expanses of conifers and aspen trees. Colorado also has several areas of non-traditional forests. These non-traditional forest sites contain "significant amounts of tree vegetation"; such as wooded draw on the prairies and plains, conservation plantings, linear forests in riparian areas, and important urban and community forests. These "non-traditional forests" provide many essential benefits to the people of Colorado and are a necessary to the overall Forest Health in the state.

Colorado State Forest Service (FIA crews) conducted a pilot project of Urban Forest Health Monitoring (U-FHM) in the state from 2005 – 2009. This study included plot design and data collection similar to that of standard FIA work. Several urban sites around the state were examined for tree species (Fig.1) and preliminary analyses completed to describe and help quantify monetary values associated with these urban forests (Fig.2).

Figure 1. Trees Species Distribution in Colorado's Urban Forest Health Monitoring Plots

This chart shows the types abundance of tree species found in urban areas and approximate amounts.

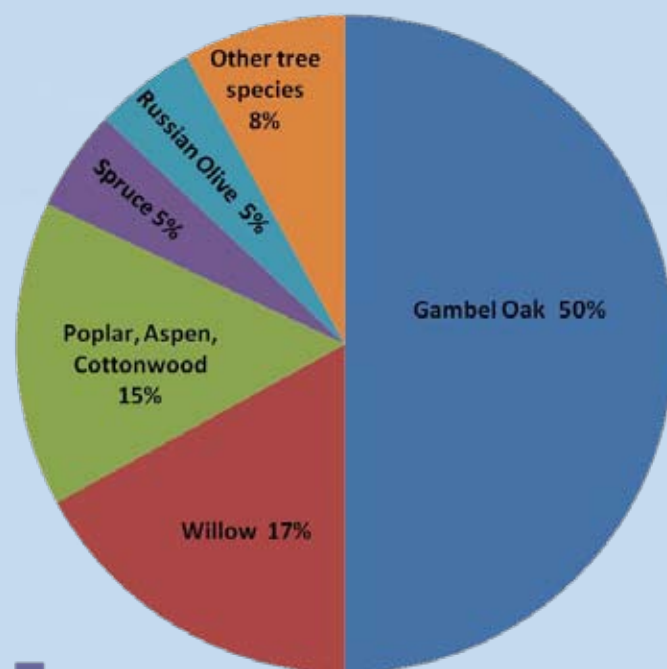
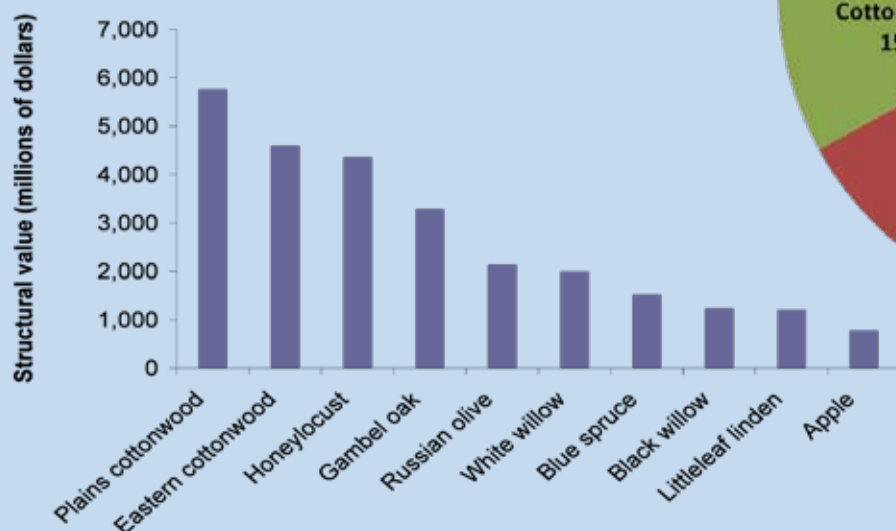
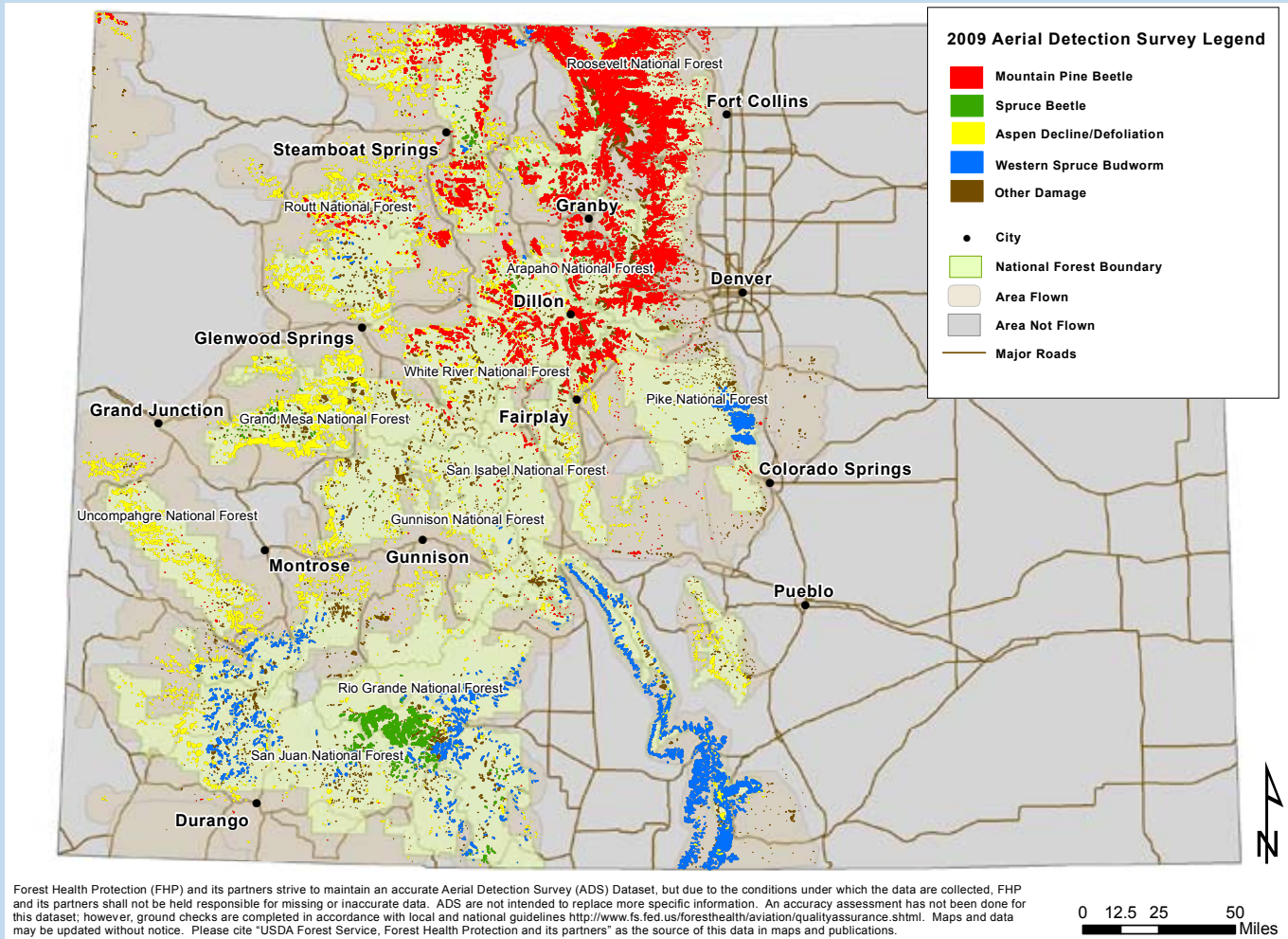


Figure 2. Compensatory Value = \$26.8 billion

This graph indicates the possible monetary value of these trees.



2009 COLORADO AERIAL DETECTION SURVEY



Components of Change and Forest Health Issues:

Forest Health conditions in Colorado have been tremendously impacted by epidemic bark beetle populations. Other insect and disease populations have also increased causing significant tree mortality. Below are brief descriptions of the insects and diseases affecting Colorado Forest Health. These outbreaks were extensively studied in 2009 using aerial and ground surveys performed by USDA Forest Service and Colorado State Forest Service agencies. The 2009 aerial survey map (Fig.3) and further description of survey findings (Fig.4) and Forest Health Issues in Colorado follow.

Mountain Pine Beetle (MPB) - Mountain pine beetle is a native insect that attacks and kills lodgepole, ponderosa, limber, and bristlecone pines. MPB continues to be a dominant forest health issue in Colorado due to the vast amount of acres affected by the current epidemic which began in the late 1990's. The majority of the trees killed during this epidemic have been lodgepole pine; however, ponderosa and limber pine have been affected as well. Portions of Grand and Summit counties, which are considered the epicenter of the current epidemic, showed a decline in the intensity of

active infestations in 2009 due to the near depletion of acceptable pines. Younger stands of regenerating trees and a few scattered, older trees remain in these areas. The 2009 aerial survey season revealed that infestations in forests east of the Continental Divide continued to show an increase in MPB activity. New clusters of MPB activity were apparent in lower elevation ponderosa pine along the Front Range Mountains, extending from Larimer County and north into Wyoming. The amount of area being actively affected by MPB infestation in 2009 encompasses approximately 1,046,000 acres.

Spruce Beetle - Spruce beetle attacks and kills high elevation Engelmann spruce trees and historically occurs in areas where wind-thrown, damaged spruce trees allow the spruce beetle populations to develop. A significant spike in the amount of area affected by spruce beetle in Colorado was detected with aerial surveys in 2009. Approximately 114,000 acres of active spruce beetle populations were mapped in 2009; this is a significant increase from the 64,000 acres found in 2008 surveys. The current spruce beetle outbreaks have caused

Figure 4. Number of damaged forest acres observed in the 2009 aerial survey

Agent	Acres
Mountain Pine Beetle	1,046,000
Spruce Beetle	114,000
Western Spruce Budworm	382,000
Aspen Dieback and Mortality	342,000
Aspen Defoliation	178,000



the mortality of much of the mature Engelmann spruce in portions of the state. The most active infestations are occurring in southern Colorado near Hinsdale and Mineral counties.

Western Spruce Budworm - Western spruce budworm is a defoliating insect which feeds on the buds and foliage of Douglas-fir, true firs, and spruce as well as other conifers. The feeding of the insects can lead to branch dieback, top kill, and tree mortality. The damage caused by western spruce budworm is visible as a brown discoloration. The amount of aerially visible damage as a result of western spruce budworm more than doubled from 2008 to 2009. The number of acres mapped increased from approximately 155,000 in 2008 to 382,000 in 2009. Significant infestations were mapped in the Culebra, Sangre de Cristo, San Juan, Flat Top and Rampart Mountain Ranges during the 2009 survey.

Aspen Dieback and Mortality - Aspen dieback and mortality (also referred to as sudden aspen decline) continues to be a focus of monitoring both in aerial surveys and with ongoing research on the ground. It is believed that a confluence of factors may be responsible for the decline of aspen including: drought, wood boring insects, aspen bark beetles, defoliation, and diseases of aspen. The age of many aspen stands may also play a role in the trees susceptibility to the aforementioned damage agents. Aspen stands are considered mature at around 60 years and many of the aspen stands in Colorado today are believed to be over 100 years old. These older stands are more easily stressed and can become subject to numerous damage agents. The amount of aerially visible aspen dieback and mortality in 2009 was approximately 342,000 acres which is a reduction from 542,000 acres in 2008. The reduction

may be attributable to regeneration masking the dead crowns, sparse crowns recovering due to an increase in precipitation levels, or other factors.

Aspen Defoliation - The amount of defoliated aspen that was mapped from aerial surveys showed a marked increase from 11,000 acres in 2008 to 178,000 in 2009. Landscape level defoliation was most striking in areas near Red Table Mountain and Grand Mesa. Aspen defoliation can be caused by a variety of agents including large aspen tortrix, western tent caterpillar, Marsonnina leaf blight, among others. Ground surveys are required to determine the specific agent(s) involved; however, it is believed that a significant portion of the acres mapped in 2009 are the result of an outbreak of Marsonnina leaf blight. Marsonnina leaf blight is a disease caused by a fungus that infects the leaves of aspen and can lead to near total defoliation. A wet growing season in 2009 may have been a contributing factor to the outbreak. Monitoring of this forest health concern will continue.

Colorado State University specialists have learned much about an alarming new disease that has killed black walnuts planted in landscapes along the Front Range urban corridor. The disease, called thousand cankers disease, is vectored by the tiny walnut twig beetle found in native walnut stands in the southwestern United States. Its spread and deadly affect on planted black walnut in Colorado and other western states has caused great concern that it could devastate native black walnut stands in the eastern United States. With funding from the US Forest Service, Colorado State Forest Service and Colorado State University have partnered with neighboring states to develop surveys and educational outreach to prevent its spread.

For further information on Forest Health in Colorado, especially during the "missing years" of Forest Health Highlight reports please refer to the websites listed below.



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<http://csfs.colostate.edu/>
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<http://www.fs.fed.us/r2/fhm/>