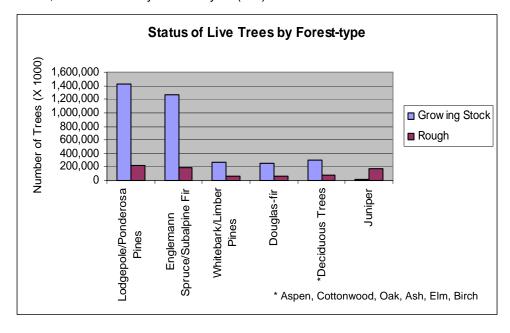# 2003 Forest Health Highlights – Wyoming

Carter Mountain in
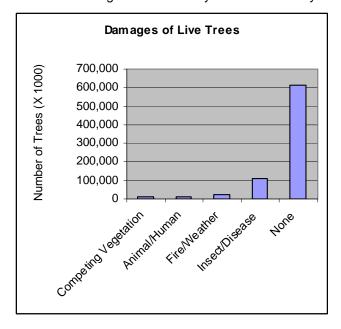Park County of
western Wyoming
(photo by Les Koch)

The Forest Resource

The most recent, complete measurement cycles of Wyoming's forests were finished in 1999 by USDA Forest Service, Forest Inventory and Analysis (FIA).

Status of Live Trees by Forest-type

Number of Trees (X 1000)

Legend:
- Growing Stock
- Rough

Categories:
- Lodgepole/Ponderosa Pines
- Englemann Spruce/Subalpine Fir
- Whitebark/Limber Pines
- Douglas-fir
- *Deciduous Trees
- Juniper

* Aspen, Cottonwood, Oak, Ash, Elm, Birch

Status was evaluated for all of the living plot trees. "Growing Stock" trees were generally healthy trees with very few damages, while "Rough" trees were often declining due to one or more major damages.

Most of the junipers and almost 23% of the whitebark and limber pines were categorized as "Rough." These trees often grow in extremely harsh sites in Wyoming where no other trees can survive.

Damages of Live Trees

Number of Trees (X 1000)

700,000
600,000
500,000
400,000
300,000
200,000
100,000
0

Competing Vegetation | Animal/Human | Fire/Weather | Insect/Disease | None

Most of the damages recorded in Wyoming's forests were disease and insect related. Agents such as bark beetles, dwarf mistletoes, and rust diseases caused these damages and eventual mortality to the trees.

Special Issues
Forest Health Insect and Disease Problems

Bark beetle outbreaks continue to be a major concern for forest managers throughout Wyoming. Populations of mountain pine beetle, spruce beetle, Douglas-fir beetle, and Western balsam bark beetle were high and even near epidemic levels in various forests in Wyoming.

Mountain pine beetle, *Dendroctonus ponderosae,* attacks lodgepole, ponderosa, limber, and whitebark pines in Wyoming.

Several forest areas throughout Wyoming were experiencing large numbers of pine mortality due to increased population levels of mountain pine beetle. Ponderosa pines in the eastern foothills of the Bighorn Mountains and in Crook/Weston counties of Black Hills forests had some large pockets of tree mortality. Several areas in Crook County had large areas of beetle caused mortality including Sundance Mountain, Green Mountain, Inyan Kara Mountain, and the Missouri Buttes. The west, south, and east sides of Devils Tower also had considerable pine mortality. Work to suppress mountain pine beetle continues near Casper and on the eastern slope of the Bighorn Mountains.

Other areas of concern for mountain pine beetle increases were in the southern portions of the state. The Medicine Bow National Forest had a significant expansion of mountain pine beetle activity in the Sierra Madre Mountain Range and in the Rock Creek watershed of the Snowy Range. This insect on the north slope of the Uinta Mountains killed large numbers of lodgepole pine. Mountain pine beetle populations in Sublette and Lincoln counties also increased causing tree mortality.

Mountain pine beetle often prefers to attack Wyoming's 5-needle pines of whitebark and limber. On Carter Mountain southwest of Cody, populations of this beetle increased in whitebark and limber pines, and then switched host species, infesting adjacent lodgepole pine stands. Mountain pine beetle has killed whitebark pines throughout Yellowstone National Park. Whitebark pine mortality near Togwotee Pass was widespread and highly visible on the Shoshone National Forest.

Spruce beetle, *Dendroctonus rufipennis*, primarily attacks Engelmann spruce in Wyoming.

Spruce beetle killed hundreds of thousands of Engelmann spruce in Wyoming during 2003. Large pockets of spruce tree mortality were observed on the Shoshone and Bridger-Teton National Forests, in Yellowstone National Park, and in the Washakie, Teton, and Absaroka Mountain Wilderness Areas of western Wyoming. The spruce beetle infestations started in the wilderness areas, and now have moved out to impact large areas of state, private, and federal lands.

A Wyoming State-trust section was heavily damaged by spruce beetle south of Irma Lake on Carter Mountain in Park County. Over 500,000 board-feet of Engelmann spruce were harvested due to mortality caused by this insect.

Other areas with spruce beetle mortality are the Bighorn Mountains, the Snowy Range, and Sierra Madre Mountains. In the Bighorn Mountains of north-central Wyoming, several areas near Shell Reservoir, Powder River Pass, and Bald Mountain are experiencing high levels of spruce beetle activity. Spruce beetle has expanded exponentially in the last two years on the Medicine Bow-Routt National Forests. This beetle infested many Engelmann spruce injured by 2002 fires near Colorado.

Douglas-fir bark beetles, *Dendroctonus pseudotsugae,* killed large Douglas-fir trees and caused extensive damages in Wyoming forests. Douglas-fir beetle infestations frequently result from disturbance events that create large volumes of weakened Douglas-fir trees in the vicinity of susceptible stands. In 1988, extensive wildfires occurred in Yellowstone National Park and the Shoshone National Forest. Populations of Douglas-fir beetle increased in the fire-scorched trees and then moved into undamaged trees in nearby stands (W.C. Schaupp Jr., K.K. Allen, D.F. Long, Biological Evaluation R2-03-02, 2002). This outbreak continued to expand and intensify.

The western front of the Bighorn Mountains also experienced outbreaks of Douglas-fir beetle. Populations increased in both the Shell and Tensleep Canyon areas. Without some sort of management actions, such as sanitation and thinning, it is likely that up to 70% of the mature Douglas-fir trees in those canyons will be killed.

Significant Douglas-fir mortality also occurred throughout the corridors of the Snake River and Greys River on the Bridger-Teton National Forest.

Subalpine Fir Mortality, caused by the western balsam bark beetle, *Dryocoetes confuses,* and various diseases*,* has been a serious forest health concern of forest managers working with subalpine fir sites in Wyoming.

There was a continuing outbreak of *Dryocoetes confusus* for over 5 years in the northern Bighorns, causing considerable subalpine fir mortality. Much of the outbreak was associated with blowdown events that occurred in the middle 1990s.
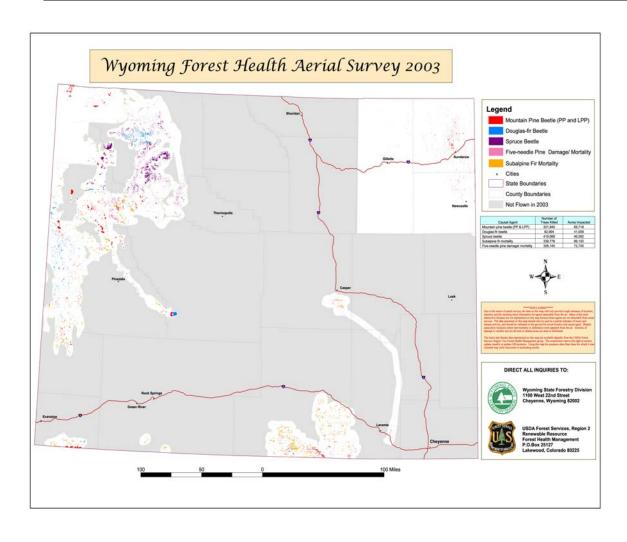
Insect and disease agents caused significant subalpine fir mortality on the Bridger-Teton and Shoshone National Forests. Large acreages of subalpine fir were declining on the North Slope of the Uinta Mountains and at Little and Pine Mountains. Many stands of subalpine fir declined on private and state properties in central Wyoming, particularly on Casper Mountain in Natrona County.

Off Plot Survey - Approximately 7 million acres of forested lands were surveyed for insect and disease caused mortality in Wyoming during 2003. Most of these areas were surveyed using small aircraft flown at low elevation over the state's forests while recording tree mortality on maps. These aerial survey data are available for review at:

ftp://ftp2.fs.fed.us/incoming/r2/ro/aerial_survey/2003/wyoming/

Aerial survey results are summarized in the following table:

Agents	Number of Acres Affected (X 1000)	Counties with high population levels of bark beetles
Mountain Pine Beetle	23.5	Carbon, Crook, Lincoln, Park, Sheridan, Sublette, Weston
Spruce Beetle	49.9	Park
Douglas-fir Beetle	17.6	Park
Subalpine Fir Mortality	53.6	Carbon, Fremont, Park
5-Needle Pine Damages	56.4	Fremont, Hot Springs, Park

Introduced Insect and Disease problems in Wyoming:

White pine blister rust disease, caused by the fungus, *Cronartium ribicola,* infects Wyoming's 5-needle or white pine species, limber and whitebark, and *Ribes* spp. of currants and gooseberry shrubs.

White pine blister rust infection levels range from low to severe in whitebark and limber pine stands throughout Wyoming. However, significant rust-free areas still exist in the Sierra Madre and the Snowy Mountains in the southeast part of the state. In 2002, a study across the Bighorn National Forest detected white pine blister rust infection at all 16 survey locations at levels as high as 100% of the plot trees. Forest Service aerial surveys show white pine blister rust, along with other agents such as mountain pine beetle, dwarf mistletoe, and needle blights, affected more than 46,000 acres of white pine in northern Wyoming.

White pine blister rust caused a marked decline in limber pines in the Laramie and Pole Mountain Ranges in south-central and southeastern Wyoming. White pine blister rust was discovered for the first time in the Snowy Mountains in 2002; however, the incidence in this range is still fairly low. Limber pines throughout Johnson and Sheridan Counties in Wyoming are severely impacted by this disease on all land ownerships.

Gypsy moth, *Lymantria dispar,* was monitored with detection traps throughout Wyoming in a cooperative state and federal program. A statewide gypsy moth survey found six adult moths in 2003. All moths were submitted for DNA testing and were found to be of the European strain, a long established strain in the northeastern United States since 1869. Three adults were captured near a residential area in Jackson (Teton County), one moth was captured in Pinedale Campground in Pinedale (Sublette County), and two moths were captured in Yellowstone National Park, one at Madison Campground and one at Fishing Bridge RV Park. Wyoming State Forestry Division's survey of Laramie, Albany, Converse, Fremont, Sheridan, Washakie, Hot Springs, Johnson, and Campbell Counties was negative.

Banded elm bark beetle (*Scolytus schevyrewi*): The banded elm bark beetle was first detected in 2002 in Denver, CO; it was discovered during 2003 in Wyoming, Kansas, Nebraska, and South Dakota. Adults are active from early spring until fall freeze and the insects can complete a generation in four to six weeks depending on weather conditions.

The banded elm bark beetle was found in Cheyenne in September 2003 in a Siberian elm windbreak. This beetle has since been found throughout Laramie County, although its distribution statewide is unknown. Of particular concern is where beetles are found in elms infected with Dutch elm disease, because banded elm bark beetle might be able to spread this disease to other American elm trees.

Forest Health Information and Assistance in Wyoming

Les Koch
Wyoming State Forestry Division
1100 West 22nd Street
Cheyenne, WY 82002
Ph: 307-777-5495
lkoch@state.wy.us

Jeri Lyn Harris
USDA Forest Service
740 Simms Street
Golden, CO 80401
Ph: 303-236-3760
jharris@fs.fed.us