

**Region 2 Forest Health
Colorado 2008 Forest Health Highlights**

Mountain Pine Beetle (MPB):

In Colorado, larger diameter lodgepole, ponderosa, limber, and bristlecone pines are attacked and killed by mountain pine beetles. The current epidemic is primarily in lodgepole pines where their trunks that have diameter greater than five inches in Eagle, Grand, Jackson, Routt, and Summit Counties, west of the Continental Divide. Increased mountain pine beetle activity has also been seen in Lake County, south of Leadville, and Park County, north of Fairplay.

Mountain pine beetle populations are at epidemic levels in high elevation larger lodgepole pine trees in Boulder, Clear Creek, Gilpin, and Larimer Counties along the northern Front Range. Losses of lodgepole pine are likely to be similar to those observed west of the Continental Divide. In addition to this lodgepole pine mortality, the ponderosa pines intermixed with lodgepole pines along the northern Front Range are currently being killed, especially in Boulder, Clear Creek, and Larimer Counties.

In lower elevation ponderosa pine forests, mountain pine beetle-killed trees increased in number in Boulder and Larimer Counties in 2008. Because of greater variability in the age, size, density and species diversity in the ponderosa pine dominated forests of the northern Front Range, the course of the mountain pine beetle epidemic and the severity of losses are difficult to predict with any degree of confidence. We suspect that tree mortality in ponderosa pine will be more variable than the losses observed in lodgepole pine forests west of the Continental Divide.

Limber and bristlecone pines are also being attacked at high elevations in Boulder, Clear Creek, and Larimer Counties and on the east slope of the Sangre de Cristo Mountains in Fremont County.

Surveys conducted by the US Forest Service and Colorado State Forest Service in 2008 detected trees killed by mountain pine beetles on 1.16 million acres in all suitable hosts in Colorado. The spread of the mountain pine beetle has impacted 400,000 new acres, which are included in Table 1 below and are represented in the "2008 Acres Impacted" column. That brings the total number of acres impacted to nearly 2 million since the outbreak was first detected in 1996. Over the course of this mountain pine beetle epidemic, lodgepole pines have been killed on over 1.9 million acres in Colorado. Mountain pine beetle affected acres by county are presented in Table 1.

Table1. Acres affected by mountain pine beetle detected by aerial survey. The time period reported in this table includes both the current MPB outbreak as well as an outbreak that occurred in Chaffee, Lake, and Park counties in the Arkansas River Valley from 1998-2004. *Acres reported for 5-needle pine include limber pine or bristlecone pine and may reflect damage by insect or disease agents other than MPB.

Colorado County	Host Tree	2008 Acres Impacted (Currently red)	1996-2008 Cumulative Acres Impacted
Alamosa	Lodgepole Pine	0	0
	Ponderosa Pine	0	430
	5-needle pines*	0	10
Archuleta	Lodgepole Pine	1	1
	Ponderosa Pine	30	16,000
	5-needle pines*	0	0
Boulder	Lodgepole Pine	42,000	50,000
	Ponderosa Pine	1,600	20,000
	5-needle pines*	2,500	8100
Chaffee	Lodgepole Pine	1,100	5,000
	Ponderosa Pine	40	77,000
	5-needle pines*	20	1700
Clear Creek	Lodgepole Pine	17,000	38,000
	Ponderosa Pine	110	4,000
	5-needle pines*	230	8,200
Conejos	Lodgepole Pine	0	0
	Ponderosa Pine	0	4,800
	5-needle pines*	0	0
Costilla	Lodgepole Pine	0	0
	Ponderosa Pine	0	4,600
	5-needle pines*	0	7
Custer	Lodgepole Pine	1	160
	Ponderosa Pine	10	34,000
	5-needle pines*	30	780
Delta	Lodgepole Pine	0	2
	Ponderosa Pine	0	6
	5-needle pines*	0	0
Dolores	Lodgepole Pine	0	0
	Ponderosa Pine	40	550
	5-needle pines*	0	0
Douglas	Lodgepole Pine	260	270
	Ponderosa Pine	110	33,000
	5-needle pines*	0	0
Eagle	Lodgepole Pine	75,000	156,000
	Ponderosa Pine	650	3,700
	5-needle pines*	30	160

Colorado County	Host Tree	2008 Acres Impacted (Currently red)	1996-2008 Cumulative Acres Impacted
El Paso	Lodgepole Pine	0	2
	Ponderosa Pine	90	13,000
	5-needle pines*	0	0
Elbert	Lodgepole Pine	0	0
	Ponderosa Pine	0	390
	5-needle pines*	0	0
Fremont	Lodgepole Pine	4	170
	Ponderosa Pine	130	31,000
	5-needle pines*	500	1,800
Garfield	Lodgepole Pine	5,200	6,700
	Ponderosa Pine	0	60
	5-needle pines*	10	400
Gilpin	Lodgepole Pine	12,000	23,000
	Ponderosa Pine	90	2,500
	5-needle pines*	1,100	14,000
Grand	Lodgepole Pine	208,000	549,000
	Ponderosa Pine	0	470
	5-needle pines*	210	3,100
Gunnison	Lodgepole Pine	0	2,500
	Ponderosa Pine	70	1,300
	5-needle pines*	0	0
Hinsdale	Lodgepole Pine	0	3
	Ponderosa Pine	10	3,200
	5-needle pines*	0	0
Huerfano	Lodgepole Pine	0	50
	Ponderosa Pine	2	26,000
	5-needle pines*	0	220
Jackson	Lodgepole Pine	233,000	347,000
	Ponderosa Pine	400	740
	5-needle pines*	1,200	6,400
Jefferson	Lodgepole Pine	80	1,700
	Ponderosa Pine	250	27,000
	5-needle pines*	0	5
La Plata	Lodgepole Pine	0	0
	Ponderosa Pine	2	12,000
	5-needle pines*	0	0
Lake	Lodgepole Pine	3,800	8,900
	Ponderosa Pine	1	300
	5-needle pines*	30	560
Larimer	Lodgepole Pine	187,000	209,000
	Ponderosa Pine	1,900	50,000
	5-needle pines*	6,600	27,000

Colorado County	Host Tree	2008 Acres Impacted (Currently red)	1996-2008 Cumulative Acres Impacted
Las Animas	Lodgepole Pine	0	10
	Ponderosa Pine	0	12,000
	5-needle pines*	0	6
Mesa	Lodgepole Pine	0	0
	Ponderosa Pine	60	5,200
	5-needle pines*	0	0
Mineral	Lodgepole Pine	0	0
	Ponderosa Pine	0	710
	5-needle pines*	0	0
Moffat	Lodgepole Pine	9,700	11,000
	Ponderosa Pine	0	0
	5-needle pines*	90	100
Montezuma	Lodgepole Pine	0	0
	Ponderosa Pine	40	660
	5-needle pines*	0	0
Montrose	Lodgepole Pine	0	0
	Ponderosa Pine	160	1,900
	5-needle pines*	0	0
Ouray	Lodgepole Pine	0	5
	Ponderosa Pine	50	180
	5-needle pines*	0	0
Park	Lodgepole Pine	9,400	12,000
	Ponderosa Pine	260	89,000
	5-needle pines*	30	270
Pitkin	Lodgepole Pine	5,200	11,000
	Ponderosa Pine	20	80
	5-needle pines*	0	0
Pueblo	Lodgepole Pine	0	0
	Ponderosa Pine	10	21,000
	5-needle pines*	0	0
Rio Blanco	Lodgepole Pine	18,000	25,000
	Ponderosa Pine	0	30
	5-needle pines*	0	100
Rio Grande	Lodgepole Pine	0	0
	Ponderosa Pine	0	3,300
	5-needle pines*	0	0
Routt	Lodgepole Pine	245,000	310,000
	Ponderosa Pine	80	100
	5-needle pines*	210	420
Saguache	Lodgepole Pine	3	780
	Ponderosa Pine	2,300	38,000
	5-needle pines*	30	330

Colorado County	Host Tree	2008 Acres Impacted (Currently red)	1996-2008 Cumulative Acres Impacted
San Miguel	Lodgepole Pine	0	10
	Ponderosa Pine	40	2,700
	5-needle pines*	0	10
Summit	Lodgepole Pine	65,000	125,000
	Ponderosa Pine	0	20
	5-needle pines*	260	440
Teller	Lodgepole Pine	0	10
	Ponderosa Pine	90	9,600
	5-needle pines*	0	20

Some campgrounds were closed or had delayed to openings in 2008 due to the large number of hazard trees. Vegetation management planning to remove dead trees and reforest developed recreation sites has become increasingly important.

Federal, state and local entities have formed cooperative working groups to address removal and utilization of hazardous dead trees .

Other bark beetles such as ips engraver beetles and twig beetles that reproduce in the smaller diameter portions of the mountain pine beetle killed trees have also increased and killed smaller diameter lodgepole pines. Continued dry conditions in the Front Range have also favored localized increases in ips populations and scattered mortality of ponderosa pines.

Spruce Beetle

Spruce beetle is killing extensive forests of high elevation old Engelmann spruce. The most active infestations are occurring in southern Colorado. **In 2008, 64,000 acres of spruce killed by spruce beetle were detected by aerial surveys (Table 2).** The largest outbreak is spreading from the Weminuche Wilderness on the San Juan National Forest with Hinsdale, Mineral counties most dramatically impacted. Notable spruce beetle outbreaks are also occurring on the Rio Grande NF in Conejos and Rio Grande Counties and on the San Juan National Forest in Archuleta County. A large spruce beetle epidemic on the Routt National Forest in Routt and Jackson Counties killed much of the older spruce in this area from 2001 - 2004. Active spruce beetle

populations have been detected by ground surveys on the Arapaho –Roosevelt NF in Larimer County

Spruce beetle populations typically build up in old spruce forests where scattered windthrown trees have provided habitat for outbreak populations to develop. Windthrown trees have led to a building epidemic on the Grand Mesa in Mesa and Delta Counties and more recently in the Wet Mountains in Custer County.

Table 2. Acres affected by spruce beetle detected by aerial survey.

Colorado County	2008 Acres Impacted	1996-2008 Cumulative Acres Impacted
Archuleta	1,200	4,500
Boulder	40	40
Chaffee	3	10
Clear Creek	1	30
Conejos	1,300	11,000
Costilla	2	1,400
Custer	30	820
Delta	430	3,000
Dolores	20	1,800
Douglas	1	20
Eagle	2,200	4,100
El Paso	0	10
Fremont	2	40
Garfield	510	4,100
Gilpin	2	7
Grand	780	2,100
Gunnison	160	4,900
Hinsdale	12,000	52,000
Huefano	0	900
Jackson	1,600	63,000
Jefferson	3	6
La Plata	140	4,400
Lake	3	40
Larimer	1,300	11,000
Las Animas	0	650
Mesa	400	9,800
Mineral	34,000	79,000
Moffat	0	600
Montezuma	0	290

Montrose	0	500
Ouray	40	1,400
Park	8	10
Pitkin	1,200	7,300
Pueblo	110	2,100
Rio Blanco	0	3,600
Rio Grande	5,200	11,000
Routt	1,100	81,000
Saguache	70	2,800
San Juan	4	1,600
San Miguel	20	890
Summit	300	330

Aspen Decline

Aspen decline continues to be a forest health concern throughout the region; monitoring and research have begun to describe and explain these events. Many of the Colorado aspen forests have mature trees that are more susceptible to natural stresses and dying due to multiple damage agents – for example drought, defoliation, and aspen diseases. Normal aerial surveys usually indicate aspen problems but in 2008 the survey methods focused more on aspen tree mortality and severity of damage and **542,000 acres were observed with these aspen decline problems (Table 3)**. Ground surveys still remain the best method for assessing aspen problems.

Table 3. Acres affected by aspen decline detected by aerial survey

Colorado County	2008 Acres Impacted Low	2008 Acres Impacted Moderate	2008 Acres Impacted High	2008 Acres Impacted Total
Archuleta	0	900	2,600	3,500
Boulder	0	80	30	110
Chaffee	50	3,600	850	4,500
Clear Creek	0	7	80	87
Conejos	0	150	2,000	2,150
Costilla	0	0	180	180
Custer	80	540	3,900	4,520
Delta	0	6,300	12,000	18,300
Dolores	0	3,000	8,800	11,800
Douglas	0	20	0	20
Eagle	0	18,000	2,700	20,700
El Paso	0	0	10	10
Fremont	10	700	1,900	2,610

Garfield	0	31,000	7,700	38,700
Gilpin	0	40	0	40
Grand	0	3,100	4,800	7,900
Gunnison	130	41,000	33,000	74,130
Hinsdale	40	5,100	920	6,060
Huerfano	0	130	1,900	2,030
Jackson	90	7,000	4,400	11,490
Jefferson	0	40	3	43
La Plata	0	730	3,900	4,630
Lake	0	590	120	710
Larimer	0	1,200	3,800	5,000
Las Animas	0	50	590	640
Mesa	0	16,000	22,000	38,000
Mineral	0	7,500	770	8,270
Moffat	0	14,000	11,000	25,000
Montezuma	0	7,800	11,000	18,800
Montrose	0	11,000	15,000	26,000
Ouray	0	6,400	8,500	14,900
Park	20	4,200	17,000	21,220
Pitkin	0	13,000	730	13,730
Pueblo	0	220	590	810
Rio Blanco	0	22,000	7,700	29,700
Rio Grande	0	1,400	1,700	3,100
Routt	150	58,000	41,000	99,150
Saguache	20	12,000	1,800	13,820
San Juan	0	7	200	207
San Miguel	0	1,900	7,100	9,000
Teller	0	230	100	330

Douglas-fir Tussock Moth

Douglas-fir tussock moth has caused extensive **defoliation on 1,800 acres** along the Rampart Range in Douglas and Jefferson Counties. Douglas-fir mortality in this area is expected to be high. Ground surveys suggest that this outbreak may be over. Parasite levels of the moth are high and pheromone trap catches of male moths declined.