

**Mountain pine beetle**, *Dendroctonus ponderosae* Hopk., killed approximately 100 million board feet of western white pine on about 5,000 acres in Lightning Creek, Kaniksu National Forest, Idaho. About 1,000 acres of mixed lodgepole and ponderosa pine on State, private, and Lolo National Forest land near St. Regis, Mont., are very heavily infested. Logging-for-control is planned for both areas during 1970. Endemic infestations are present in ponderosa pine in the Big and Little Snowy Mountains, on BLM lands, and on the Lewis and Clark National Forest near Lewistown, Mont.

About 400 infested ponderosa pine were sprayed with ethylene dibromide to clean up an infestation on Monarch Mountain, Belt Creek Ranger District, Lewis and Clark National Forest. Infestations in lodgepole pine continue to decline on the Yaak District, Kootenai National Forest, Mont.

**Douglas-fir beetle**, *Dendroctonus pseudotsugae* Hopk. Serious drought conditions during 1966-67 caused a general weakening and decline of vigor in Douglas-fir, resulting in heavy 1968 attacks by Douglas-fir beetles. Large volumes of Douglas-fir were killed on the Colville National Forest, Wash.; along the Lochsa River, Clearwater National Forest, Idaho; on the east-facing slopes of the Salmon River from Whitebird south to Riggins, Idaho; and throughout portions of the Bitterroot, Lolo, Flathead, and Lewis and Clark National Forests, Mont. Extensive salvage sales are in progress to remove infested dead timber. Continued drought conditions may result in increased beetle activity in some areas during 1970.

**Pine engraver**, *Ips pini* (Say), caused top kill of mature trees and infested patches of pole sized ponderosa pine on the Nezperce and Coeur d'Alene National Forest, Idaho, and on the Bitterroot, Lolo, and Flathead National Forests, Mont.

Most outbreaks occurred adjacent to logging, thinning, or road construction areas. Populations are expected to remain at the same level in 1970.

**Fir engraver**, *Scolytus ventralis* LeC. Outbreaks of this bark beetle declined in 1969. Light infestations occurred in scattered small groups of grand fir on the Nezperce, St. Joe,

and Coeur d'Alene National Forests, Idaho. The downward trend will probably continue next year.

**Pine butterfly**, *Neophasia menapia* (Felder & Felder). Large numbers of pine butterflies were observed hovering over large ponderosa pine trees on the Nezperce National Forest, Idaho, and Lolo National Forest, Mont. As many as 200 adults were observed flying around trees near Missoula. Egg mass counts averaged 10 eggs per needle. Increased defoliation is expected next year.

**A pine looper**, identified as *Phaeoura mexicanaria* (Grote), caused serious defoliation of ponderosa pine lands of the Bureau of Indian Affairs and Custer National Forest near Lame Deer and Ashland, Mont. Pupal counts average four per square foot of duff sample. Populations are heavily parasitized by hymenopterous and dipterous parasites and a native virus is present. These factors may reduce looper populations next year.

**Other insects.** Occurrence of a larch sawfly, *Pristiphora leechi* Wong and Ross, was reported on the Coeur d'Alene National Forest for the first time since 1958 by Intermountain Station entomologists. Populations of fall webworms, *Hyphantria cunea* (Drury), caused widespread defoliation upon a variety of deciduous trees. Heavy spruce top killing by Engelmann spruce weevil, *Pissodes engelmanni* Hopk., occurred in spruce plantations on the Nezperce and Flathead National Forests.

## CENTRAL ROCKY MOUNTAINS<sup>5</sup>

### (R-2)

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### Conditions in Brief

The mountain pine beetle continues to be the most important forest insect in the Central Rocky Mountains. Severe infestations in ponderosa pine have been found on the Black Hills,

<sup>5</sup> Includes forested lands in Colorado, Kansas, Nebraska, South Dakota, and Wyoming.

Roosevelt, and Pike National Forests, and on State and private lands. Static to decreasing populations occurred on the San Juan and Big-horn National Forests. Infestations in lodgepole pine exist on the Arapaho, White River, and Shoshone National Forests and on BLM and State and private lands.

Chemical control integrated with timber sales has reduced timber losses on the White River, San Juan, and Arapaho National Forests. Control on the Roosevelt and Black Hills National Forests has reduced tree mortality resulting in a holding action on salvage operations until sales are made.

The Engelmann spruce beetle infestations have become epidemic on the Medicine Bow, San Juan, and Grand Mesa-Uncompahgre National Forests. Populations are expected to increase throughout the Region.

Spruce budworm (western species) defoliation declined to the lowest level for the past decade. The decline was due to unseasonably late snow and freezing temperatures affecting mortality of the insect and new growth of the host.

### Status of Insects

**Mountain pine beetle**, *Dendroctonus ponderosae* Hopk., remains a serious problem in stagnated, second-growth, and mature ponderosa pine stands on the Black Hills, Roosevelt, Pike, and San Juan National Forests affecting over a quarter-million acres.

On the Black Hills National Forest, there are 17,000 infested trees scattered over 200,000 acres, occurring mostly in groups of one to ten. In addition, on State and private lands an estimated 20,000 attacked trees occur mainly in large groups. Control was recommended to protect present and currently proposed timber sale areas.

The Roosevelt National Forest infestation continued to be a problem in stagnated, mistletoe-infested, mature trees on rough terrain.

The beetle activity on the Glade District of the San Juan National Forest has been controlled except in House Creek and Boggy Draw. Even with the accelerated sale program on the District, chemical control may be needed for 2 more years.

Mountain pine beetle activity is static or slightly decreasing at Dillon, Colo. Two new infestations near Granby and Hot Sulphur Springs, Colo. are epidemic. A joint timber sale program by BLM, State, and private landowners should control these infestations. Heavy tree killing in northwestern Colorado on BLM and State lands continues with no control planned.

**The Engelmann spruce beetle**, *Dendroctonus rufipennis* (Kirby), has become a serious problem. A recent survey in the Medicine Bow National Forest indicates that more than 7,000 standing trees are infested. The spruce beetle populations on the San Juan National Forest increased substantially in windthrown areas. Two small problem areas were found on the Grand Mesa-Uncompahgre National Forest. Logging and trap-tree programs are planned to control these spruce beetle infestations.

**Spruce budworm** (western species), *Choristoneura occidentalis* Free., infestations dramatically decreased in severity and acreage. The decrease was caused by subnormal temperatures accompanied by snow in the early summer; and by increased parasitism.

**Douglas-fir beetle**, *Dendroctonus pseudotsugae* Hopk., continues to be a problem in Douglas-fir stands on rough terrain in Colorado and Wyoming forests. The largest infestation of Douglas-fir beetle is located on the northern portion of the Bighorn National Forest.

Mature high risk ponderosa pine on the San Juan and Grand Mesa-Uncompahgre National Forests are being killed by attacks of a complex of *Dendroctonus* bark beetles. The beetles responsible are the mountain pine beetle, *D. ponderosae* Hopk., the western pine beetle, *D. brevicornis* LeC., and the roundheaded pine beetle, *D. adjunctus* Blandf. The removal of high-risk trees has been recommended to solve this problem.

**Other insects.** The tiger moth, *Halisidota ingens* Hy. Edw., has been found on ponderosa pine on the Roosevelt National Forest. Defoliation of aspen by fall webworm, *Hyphantria cunea* (Drury), was less noticeable than last year. A looper, *Lambdina* sp., was widely scattered in Colorado heavily defoliating oak—most

severely defoliated was an area of 2,000 acres on the White River National Forest. Defoliation caused by the spear-marked black moth, *Eulype hastata* (L.), was heavy on birch in the northern Black Hills. Western balsam bark beetle, *Dryocoetes confusus* Sw., continues to kill small groups of alpine fir throughout Colorado and Wyoming. Sugar pine tortrix, *Choristoneura lambertiana* (Busck), and a pine tip moth, *Rhyacionia* sp., caused terminal damage on ponderosa pine on the San Juan National Forest.

## SOUTHWESTERN STATES (R-3)<sup>6</sup>

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### Conditions in Brief

Bark beetles continue to be the primary pest of concern to land managers in Region 3. Engelmann spruce beetle infestations on the Santa Fe National Forest and Fort Apache Indian Reservation have killed 9 million board feet of standing timber and pose an immediate threat to an additional 680 million board feet of mature spruce. Smaller centers of infestation are scattered throughout the Region. The roundheaded pine beetle is thwarting the management objective in the ponderosa pine sapling and pole stands on the Lincoln National Forest and Mes-calero-Apache Indian Reservation. A hundred thousand acres are infested by this pest. An increase in mountain pine beetle activity was noted in northern New Mexico.

Defoliator activity remains light. Spruce budworm (western species) populations are endemic. Two Douglas-fir tussock moth infestations were active in Arizona; one collapsed from a natural virus epizootic; heavy defoliation on 200 acres is expected in the other area. Southwestern pine tip moth remained active on 100,000 acres in Arizona.

Cultural control was directed against the spruce beetle, mountain pine beetle, and an Arizona five-spined ips beetle. Chemical control

methods were used to suppress populations of the pinyon needle scale and western tent caterpillar. Maintenance control using Thuricide 90 T was directed against the Nevada buck moth. Refinement of pest control techniques, using the herbicide Silvisar 510, is continuing for bark beetle control.

Other forest pests, primarily in recreational areas, are requiring close surveillance.

### Status of Insects

Engelmann spruce beetle, *Dendroctonus rufipennis* (Kirby) is nearing epidemic conditions throughout the mature and overmature spruce forests of the Southwest. Volume losses are excessive, with activity intensifying at two major infestation centers and nine minor centers in the Region.

The highly aggressive beetle populations on the Santa Fe National Forest, near Espanola, N. Mex. have resulted in 1,400 acres infested this year, with subsequent destruction of 5 million board feet of spruce timber. The epicenter, 506 acres of infested spruce, was salvaged this year. As a serious situation continues to exist, suppression design will be oriented toward an integrated cultural control program in an effort to protect 80 million board feet of timber adjacent to the infested area.

On the Fort Apache Indian Reservation, near Whiteriver, Ariz., Engelmann spruce beetle activity has risen sharply. In the Mt. Baldy area, 2,700 acres are known to be infested, where 4 million board feet of spruce have already succumbed to this pest. A total of 600 million board feet of virgin spruce is threatened on Indian land, plus an additional 10 million board feet on the adjoining Apache National Forest.

In addition to the above two major areas, nine smaller centers are active, four in northern New Mexico and five in northern Arizona. The four in northern New Mexico are located on the Philmont Scout Ranch and on the Carson, Cibola, and Santa Fe National Forests. The five in northern Arizona are on the Apache, Coconino, Coronado, and Kaibab National Forests, and on Grand Canyon National Park. Control through logging and burning of residual slash

<sup>6</sup> Includes all forested lands in Arizona and New Mexico and National Park Service land in southern Colorado and western Texas.