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Douglas-fir needle midge larvae inside gall on Douglas-fir needle.  
Orofino, Idaho.

## CENTRAL ROCKY MOUNTAINS

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### Conditions in Brief

For the fourth consecutive year the Black Hills beetle was the most serious forest insect problem in the Central Rocky Mountains, and land managers treated more than 299,000 beetle-infested pines in control operations. The serious outbreak in the Black Hills of South Dakota and Wyoming was checked through concerted efforts of Federal, State, and private land managers. An outbreak in the Big Horn Mountains, north-central Wyoming, was also checked by a joint program. In Colorado, these land



F-509416

The forest tent caterpillar defoliated birch, alder, willow, aspen, and cottonwood trees on many acres along the Priest River drainage, Idaho.

managers prevented beetle populations from increasing along the Front Range through effective suppression programs. Over on the western slope, an outbreak was suppressed on the Grand Mesa-Uncompahgre National Forest by salvaging the infested trees. A new outbreak of the Black Hills beetle was discovered on the Medicine Bow National Forest in south central Wyoming.

Land managers rediscovered in 1964 that tree disposal was extremely effective in suppressing bark beetles. More than 172,000 beetle-infested pines were cut and salvaged or piled and burned. Chemical suppression was also made more effective. All of the infested trees chemically treated were first cut. Thanks to the modern chain saw, cost of felling the trees was only a small part of total treatment cost.

A potential outbreak of the Engelmann spruce beetle was discovered in the Green Horn Mountains on the San Isabel National Forest. Beetle broods in windthrown trees pose a threat to several thousand acres of overmature Engelmann spruce. A trap tree program will be used in an effort to prevent these beetles from spreading into the standing trees. Elsewhere in

Colorado, Engelmann spruce beetle populations remained at endemic levels.

The scope and severity of spruce budworm infestations in Colorado forests increased somewhat over a year ago. Defoliation heavy enough to be seen from the air was observed in 97,800 acres of fir type. The most active infestation was along the eastern slope of the Sangre de Cristo Range, San Isabel National Forest.

## Status of Insects

**Black Hills beetle, *Dendroctonus ponderosae*** Hopk. Land managers were successful in reducing the serious Black Hills beetle outbreak in the Black Hills in South Dakota and Wyoming. More than 238,000 beetle-infested trees were either salvaged (34,000), piled and burned (118,000), or chemically treated (86,000). Participating in the suppression program were Home-stake Mining Co., Anaconda Co., Dead-broke and Bald Mountain Mining Cos., South Dakota and Wyoming State Forest Services, Bureau of Land Management, National Park Service, and the U.S. Forest Service. An intensive suppression program is planned for 1965 to reduce the beetles to endemic numbers. This will require treating about 79,000 infested trees.

The Bureau of Land Management, Wyoming State Forest Service, and the U.S. Forest Service prevented the Black Hills beetle outbreak in the Big Horn Mountains from increasing in scope and intensity by burning or chemically treating more than 16,000 infested trees.

In Colorado, the State Forest Service, Bureau of Land Management, National Park Service, and the U.S. Forest Service suppressed Black Hills beetle outbreaks along the Front Range Mountains. More than 40,000 beetle-infested pines were either burned or chemically treated.

On the western slope of Colorado, the Forest Service checked a beetle outbreak on the Uncompahgre Plateau by salvaging about 1,500 beetle-infested trees.

A Black Hills beetle infestation was discovered on the Medicine Bow National Forest in south-central Wyoming. The infestation, about 600 acres in size, occurred on Penneck Mountain northeast of Saratoga, Wyo. Both lodgepole and limber pine were killed. This is the first reported activity by this beetle in this area since the 1932-39 outbreak that destroyed more than 400,000 trees before being brought under control. In general, the infestation was classified as light. However, it will be carefully watched in 1965.

**Mountain pine beetle, *Dendroctonus ponderosae*** Hopk. (*D. monticolae* Hopk.). Infestations on the Wind River District of the Shoshone

National Forest in northwest Wyoming were kept in check during 1964 by treating 3,500 infested lodgepole pines. Farther to the north, outbreaks in limber pine on the Belknap Creek drainage southwest of Cody, Wyo., have run their course. Woodpecker predation of beetle broods is partly responsible for the decline in infestations in this area. Elsewhere in northwest Wyoming east of the Continental Divide, beetle populations were at endemic levels.

**Engelmann spruce beetle, *Dendroctonus obesus*** (Mann.) (*D. engelmanni* Hopk.). Engelmann spruce beetle populations in the Central Rocky Mountains are seldom really low because the pest maintains its numbers by breeding in wind-thrown spruce. In 1964 a potentially serious infestation was discovered on the Green Horn Mountains of the San Isabel National Forest. A severe windstorm in December 1962 blew down several thousand Engelmann spruce scattered over approximately 12,000 acres of over-mature spruce type. All the down trees contained large numbers of beetles in 1964 that will emerge in June and July of 1965. To combat the hazards, plans are being made for a trap tree control program. Several patches of trees will be cut to serve as traps and after beetle flight will either be salvaged or piled and burned. Plans are also underway to reduce the insect hazard in this area by harvesting the over-mature Engelmann spruce. Twenty million board feet of spruce has already been sold adjacent to the blowdown.

The Engelmann spruce beetle continued at an endemic level throughout other spruce forests in the Central Rocky Mountains.

**Spruce budworm, *Choristoneura fumiferana*** (Clem.). Spruce budworm populations increased sharply along the eastern slope of the Sangre de Cristo Mountains, San Isabel National Forest, Colo. The infestation was estimated to involve 80,000 acres. Egg mass surveys made in August indicated that defoliation in this area will be moderate to heavy in 1965. In other forest areas of Colorado, spruce budworm populations remained endemic. Defoliation, heavy enough to be seen from the air, covered 97,800 acres or about two times more than the number of acres reported in 1963.

**Pandora moth, *Coloradia pandora*** Blake. Populations of this important defoliator declined on the Medicine Bow, Roosevelt, and Routt National Forests, Colo. and Wyo., in 1964. Defoliation was not heavy enough to be seen except by close inspection of the infested trees. Damage to lodgepole pine stands is expected to be light in 1965.

**Douglas-fir beetle, *Dendroctonus pseudotsugae*** Hopk. Douglas-fir beetle populations increased in southern Colorado. Light to moderate tree killing was reported throughout the

Douglas-fir type in the San Juan National Forest. The heaviest centers of infestation were located on Devil Mountain and on the Little Sand Creek, Sand Creek, and Mosca Creek drainages. The infestation in the Powderhorn area southwest of Gunnison also increased in 1964. Elsewhere in the Central Rocky Mountains, beetle populations remained endemic.

**Western balsam bark beetle, *Dryocoetes confusus* Sw.** This insect did little damage in 1964. Populations throughout the spruce fir type in Colorado and Wyoming are expected to remain low in 1965.

**Oregon pine ips, *Ips pini* (Say). (*I. oregonis* (Eichh.)).** The Oregon pine ips has been a periodic problem in the Black Hills of South Dakota and Wyoming for at least 30 years. During years of below average precipitation, it has been a serious problem in thinning programs. Beetle populations build up rapidly in slash and then infest crop trees. In 1964, about 9,200 crop trees in experimental thinning plots on the Black Hills Experimental Forest were sprayed with DDT to prevent attacks. The treatment was successful. In general, populations of the pest were low in 1964 and are expected to remain so in 1965.

**Great Basin tent caterpillar, *Malacosoma fragile* (Stretch).** Defoliation by this caterpillar increased in southern Colorado in 1964. Leaves of aspen on several hundred acres in the Cumbres Pass area, Rio Grande National Forest, were completely stripped. Infestations of lesser scope and severity were also found on the San Isabel and San Juan National Forests. The aspen stands along the west fork of the Cimarron River, Grand Mesa-Uncompahgre National Forest, were only lightly defoliated.

**Leaf beetle, *Chrysomela* sp.** Aspen and birch stands in the Black Hills of South Dakota were again heavily defoliated by an aspen leaf beetle. In south-central Wyoming, this insect also stripped leaves off the cottonwoods and willows along Brush Creek, Medicine Bow National Forest.

## SOUTHWESTERN STATES <sup>1</sup>

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### Conditions in Brief

Insect activity increased in the Southwest in 1964. An Engelmann spruce beetle infestation

<sup>1</sup> Includes all forested lands in Arizona and New Mexico and National Park Service land in southern Colorado and western Texas.

erupted and killed nearly 2,000 Engelmann spruce trees on Mt. Taylor in central New Mexico. The spruce budworm infestation on the Lincoln National Forest in southern New Mexico spread from 50,000 to 90,000 acres. The one on 350,000 acres of non-Federal land in northern New Mexico intensified. New outbreaks of Arizona five-spined ips and a pine bark beetle caused serious damage to stands of ponderosa pine in several areas of Arizona and New Mexico. The white fir needle miner, previously unrecorded in the Southwest, damaged several thousand acres of white fir on the Kaibab Plateau of northern Arizona. The Great Basin tent caterpillar defoliated many stands of aspen in small areas of Arizona. The Black Hills beetle was less troublesome than expected in the Manzano Mountains of central New Mexico. Infestations of Douglas-fir beetle remained static at high levels throughout the region. The pinyon needle scale was again active at Grand Canyon National Park.

Control was carried out against the Engelmann spruce beetle, a pine bark beetle, the Nevada buck moth, and two species of tent caterpillars. Except for the Engelmann spruce beetle projects, control efforts were directed against infestations in high-use recreation areas.

## Status of Insects

**Engelmann spruce beetle, *Dendroctonus obesus* (Mann.). (*D. engelmanni* Hopk.).** A serious outbreak of Engelmann spruce beetle killed 2,000 overmature Engelmann spruce trees on Mount Taylor near Grants, N. Mex. Extremely high broods and lack of natural control factors indicated a sharply increasing population. Cultural measures were immediately started for control. The 7-year-old infestation on the Carson National Forest near Taos, N. Mex., declined in extent and intensity. This decline resulted from continued logging of infested stems and burning of about 9,800 acres of infested cull logs and slash during the last 4 years. An infestation at the Snow Bowl Ski Area, Flagstaff, Ariz., remained active.

**Spruce budworm, *Choristoneura fumiferana* (Clem.).** The most aggressive budworm infestation occurred on the Lincoln National Forest, N. Mex., where it spread from 50,000 to 90,000 acres. An infestation on the Gila National Forest, N. Mex., remained at 40,000 acres. Other infestations on approximately 350,000 acres of non-Federal land near Chama and Cimarron, N. Mex., intensified. Budworm populations, which were calculated from egg mass densities, were extremely low in areas sprayed in 1962 and 1963.