# PINE BEETLE SURVEY OF 1946

# on the

# UMATILLA NATIONAL FOREST

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## Introduction

During the fall of 1935 the first steps were taken to determine the severity and extent of the western pine beetle infestation in the ponderosa pine stands within and adjacent to the Umatilla National Forest. Since then surveys have been carried on annually except during 1945 when, due to the war, manpower was not available. These surveys have been carried on through the cooperative efforts of the Forest Service and the Bureau of Entomology and Plant Quarantine.

From year to year the scope and character of the surveys has varied somewhat. During 1946 the survey was both intensive and extensive in character. The intensive phase, which consisted of a 100 percent cruise of all insect-caused losses on four semi-permanent 320-acre plots, was carried on during the period July 31 to August 22 by a Forest Service crew consisting of Messrs. Donald C. Wheat, Fred Reiter, and Gould J. Hoyt, crew leader. The extensive phase of the survey consisted of an observational reconnaissance of all forest types. The stands were viewed from roads, trails, lookouts, and other points of vantage. The writer carried on this phase of the survey in addition to supervising the crew.

## Past Losses

Climatic factors adverse to tree growth enabled pine beetle infestation, quiescent prior to 1930, to develop rapidly into an epidemic that reached its greatest intensity during 1932. The upward trend of infestation was abruptly halted during the winter of 1932-33 by extreme sub-zero temperatures that caused widespread mortality to broods of western pine beetle. The mortality coupled with improved tree growth resulted in a decline of infestation. A flare-up occurred during 1935 and 1936 and again on 1938. Then the infestation gradually declined until 1943 when it reached the lowest point recorded since the surveys began. During the latter part of 1943 and into 1944 severe drought conditions prevailed. Aided by these conditions, which were adverse to tree growth but favorable to bark beetle development, the infestation again surged upward.

## Recent Losses on Plots

Plot data indicate that the infestation increased sharply during 1944 and 1945. During these years losses on the plots amounted to some 65 board feet per acre or .63 percent of stand and 105 board feet per acre or 1.62 percent of stand respectively. The 1945 loss represents a 415 percent increase above the low point recorded during 1943. The indications are that the infestation remained more or less static during 1946. Lack of aggressiveness during the 1946 season can be attributed to the return of climatic conditions more favorable to tree growth.

The 1946 survey completed the 1944-45 loss data on the three plots of the fossil area and also provided a partial record of the 1946 losses. The Troy plot which had not been cruised since 1943 was re-activated. All the accumulated losses were marked and recorded. However, no attempt was made to identify the year in which the 1943-45 losses were killed, due to the difficulty of determining the year of a tree's death once the beetles have emerged.

The plot data are presented in Table 1.

## Current Pine Beetle Situation on the Forest

A general increase of western pine beetle infestation occurred over the forest during 1944 and 1945, the first time since 1938 that there has been such a general flare-up. Likewise this was the first time for several years that appreciable losses showed up in the stands at higher elevations. Above-normal infestation continued to expand and develop in the stands at lower elevations. In certain localities, especially in the high hazard, fringe-type stands, losses approached moderate epidemic proportions.

The most aggressive infestation was found around Wilson Prairie. The Kinzua Pine Mills have directed their logging operations into this area and are eliminating this pernicious infestation of long standing.

Losses are also heavy in the decimated stands around Dixon Guard Station. This center of infestation extends into both Kahler and Alder Creek drainages.

Another large center of less aggressive infestation exists on Deerhorn Creek and the lower portion of Five Mile Creek and also extends eastward over into the lower portion of Camas Creek. Some logging is being conducted in this area.

An aggressive center also exists in the stands facing the Grand Ronde River west of Troy, Oregon. Girdling of trees by ranchers to clear land on this area provided incubators which kept the beetle population at a high level during a period when low infestation was the general rule. Then, when conditions adverse to tree growth and favorable to bark beetle development occurred, this infestation rapidly spread back into stands that would normally be classed as of low hazard.

With construction of utilization roads into this hitherto almost inaccessible area and installation of a sawmill at Troy, stumpage assumed definite values. The ranchers are now interested in protecting their remaining stands. Undoubtedly this changed outlook of the ranchers will assist in reducing the pine beetle infestation in this area.

Infestation trends computed from the plot data were combined with information obtained on the extensive reconnaissance to prepare an estimate of the 1945 losses in the virgin ponderosa pine stands of the forest. These losses were estimated at nearly 11 million board feet. Practically all of this is attributable to the western pine beetle (*Dendroctonus brevicomis* Lec.). Other insects that also caused some damage were *D. monticolae*

Hopk., *Ips* sp., and *Melanophila* sp. The estimated losses by all species are presented in Table 2. The virgin stand acreage was computed from records of cutting furnished by the Forest Service.

## Other Insects

Bark beetles –During the past three years above-normal losses have been occurring in the stands of Douglas-fir and true fir. Groups containing 6 to 10 trees were particularly evident on that portion of the forest extending north of Elgin, Oregon. Losses in the Douglas-fir were largely caused by the Douglas-fir beetle (*Dendroctonus pseudotsugae* (Hopk.)). The flatheaded borer (*Melanophila drummondi* (Kirby)) was also responsible for some damage. The true firs were killed by a variety of engraver beetles (*Scolytus* sp.), flatheaded borers (*Melanophila* sp.) and a roundheaded borer, probably (*Tetrophium abietis* (Fall)). It appears that the peak of the epidemic occurred during 1945 and that the infestation is now declining.

Defoliators—The spruce budworm (*Archips fumiferana* (Clem.)) was discovered on the forest during the course of the 1944 hazard survey on the Heppner Ranger District. In certain localities both white fir and Douglas-fir were found to have been moderately defoliated. The infestation continued to thrive and by 1946 mature stands in many of the canyons were heavily defoliated and the understory completely stripped of foliage. Activities of the budworm were observed as far east as La Grande, Oregon. The destructiveness of this pest in this region has not been ascertained, as only two minor outbreaks have previously been recorded in Oregon.

An outbreak of the Douglas-fir tussock moth (*Hemerocampa pseudotsuga* McD.) was discovered near Troy, Oregon. The outbreak is believed to extend over some 10,000 to 12,000 acres in a mixed stand on a triangular area bounded on the north by the Wenaha River, on the southeast by the Grande Ronde River, and on the west by the Hoodoo Ridge. One hundred percent defoliation occurred in small centers ranging up to 50 acres in size located on portions of Sections 34 and 35, T. 6 N., R. 42 E., and Sections 3, 4, 9 and 10, T. 5 N., R. 42 E. The aggregate of these centers of almost complete kill probably amounts to some 500 or 600 acres. Partially defoliated trees are scattered throughout the remainder of the stand. The abundance of heavy egg deposits wherever any amount of defoliation occurred gives every indication that the infestation will increase considerably during the coming season. Unless some agency intervenes, large areas of fir that were moderately defoliated during 1946 undoubtedly will be completely stripped and killed during 1947. Damage to the immature stand is shown in Figure 1.

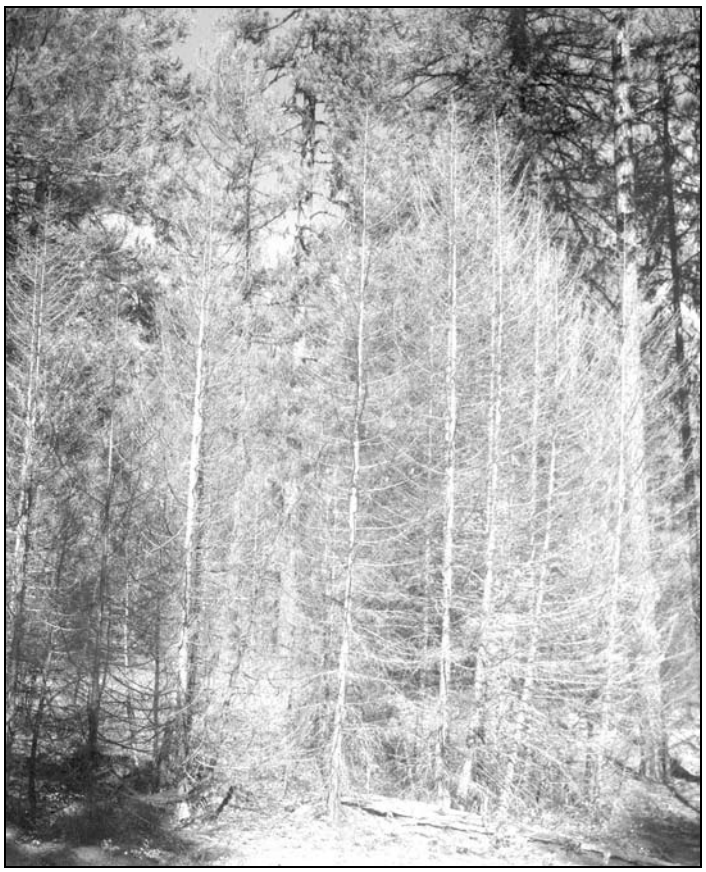

FIGURE 1
Douglas-fir poles defoliated and
killed by the Douglas-fir tussock moth.

A sawfly (*Neodiprion* sp.), the larvae of which defoliated sizeable areas of ponderosa pine reproduction on the Ochoco Forest during 1945, was discovered early in the season near Wilson Prairie and later near Opal Guard station. Apparently natural factors are serving to hold this insect in check, as the population declined during the season.

## Other Phenomena

Early in 1946 a needle-killing fungus (*Elytroderma deformans* Darker) attacked foliage of ponderosa pine on many parts of the forest. Forest pathologists report that this fungus is capable of killing reproduction and poles and also that it will seriously weaken mature trees. Although the infection was widespread no serious situation is believed to have developed.

A peculiar situation that apparently has existed for several seasons was found on an area of 300 or 400 acres of ponderosa pine on the east portion of Sec. 18, T. 7 S., R. 35 E. near Dixon Guard Station. Large groups of reproduction have died. Much more is in a dying condition. Many of the mature trees are in a very bad way. The cause of this

condition could not be ascertained. Bark beetle activity was decidedly secondary. It may have been caused by aphids or scale insects as there were some indications that sizeable populations had been present earlier in the season.

## Recommendations

No bark beetle situation sufficiently aggressive to warrant direct control measures was found on the forest during 1946.

A persistent above-normal infestation is rapidly reducing the badly decimated stands on Kahler and Alder creeks. It is recommended that salvage operations be carried out to save the remaining values before they are completely destroyed by the bark beetles.

The relatively meager information on the biology of the Douglas-fir tussock moth does not permit prognostication of trends on the Troy outbreak. However, the abundance of egg deposits over much of the area would seem to indicate an upward trend is in prospect for 1947. In view of the destructive record of this insect it is recommended (1) that an aerial survey be made to determine whether other centers of infestation are present in the region, and (2) that plans be made to control the outbreak or, in lieu of control, that adequate plans be made for salvage on an extensive scale, if need be. (It is understood that plans for salvage are now under consideration by the Forest Service, the principal holder of forested lands on the affected area).

Table 1. Ponderosa pine killed by bark beetles on virgin check plots—Umatilla National Forest and adjacent private lands.

| Plot Description | | | | | | 1944 Loss | | | | | 1945 Loss | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area & Plot | T | R | Sec. | Timber Acres | Pine Vol. M.B.M. | No. Trees | Volume B.M. | BM Per Acre | % of Stand | Ratio to 1943 | No. Trees | Volume B.M. | BM Per Acre | % of Stand | Ratio to 1944 |
| Fossil | | | | | | | | | | | | | | | |
| Stalling Butte | 8S | 26E | 5 N½ | 235 | 1,924,330 | 13 | 13,600 | 57 | .70 | 2,67 | 25 | 25,770 | 110 | 1.34 | 1.90 |
| Wilson Prarie | 6S | 26E | 33 S½ | 285 | 3,459,050 | 40 | 25,720 | 90 | .75 | 2.15 | 63 | 39,520 | 139 | 1.14 | 1.54 |
| Tupper | 6S | 27E | 16 N½ | 210 | 2,179,010 | 13 | 8,370 | 40 | .39 | 5.50 | 14 | 11,770 | 56 | .54 | 1.41 |
| Total | | | | 730 | 7,562,390 | 66 | 47,690 | 65 | .63 | 2.56 | 102 | 77,060 | 105 | 1.02 | 1.62 |
| Grande Ronde | | | | | | Total Loss for 1943-1945 | | | | | Average Loss 1943-1945 | | | Ratio to 1942 | |
| Troy | 5N | 42E | 9 S½ | 320 | 4,332,570 | 76 | 64,860 | 203 | 1.50 | | 25 | 21,620 | 67 | .50 | 3.80 |

Table 2. Estimate of insect-caused ponderosa pine losses—Umatilla National Forest

| | PINE TYPE | | | ESTIMATE OF 1946 LOSS | | | |
|---|---|---|---|---|---|---|---|
| Area & Unit | Virgin Acreage | Cutover Acreage | Total Acreage | No. of Trees | Volume M.B.M. | Trees per Section | B.M. Per Acre |
| Pomeroy | | | | | | | |
| Asotin | 49,920 | 17,580 | 67,500 | 390 | 140 | 5 | 3 |
| Dayton | 12,400 | 34,800 | 47,200 | 100 | 40 | 5 | 3 |
| Area Total | 62,320 | 52,380 | 114,700 | 490 | 180 | 5 | 3 |
| Grande Ronde | | | | | | | |
| Wenaha | 87,750 | 3,690 | 91,440 | 2,500 | 1,630 | 18 | 19 |
| Elgin | 2,350 | 47,770 | 50,120 | 20 | 10 | 5 | 4 |
| Area Total | 90,100 | 51.460 | 141,560 | 2,520 | 1,640 | 17 | 18 |
| Pendleton | | | | | | | |
| Milton | 600 | 21,000 | 21,600 | 0 | 0 | 0 | 0 |
| Meacham | 46,120 | 21,700 | 67,820 | 430 | 150 | 6 | 3 |
| Pilot Rock | 14,640 | 12,170 | 26,810 | 320 | 130 | 14 | 9 |
| Gurdane | 7,440 | 13,730 | 21,170 | 210 | 110 | 18 | 15 |
| Rhea Creek | 17,140 | 8,770 | 25,910 | 520 | 260 | 20 | 15 |
| Area Total | 85,940 | 77,370 | 163,310 | 1,480 | 650 | 11 | 8 |
| La Grande | | | | | | | |
| La Grande | 5,960 | 64,600 | 70,560 | 50 | 20 | 5 | 3 |
| Starkey | 23,940 | 74,360 | 98,300 | 290 | 130 | 8 | 5 |
| Area Total | 29,900 | 138,960 | 168,860 | 340 | 150 | 7 | 5 |
| Dale | | | | | | | |
| Ukiah | 42,970 | 26,790 | 69,760 | 1,070 | 540 | 16 | 13 |
| Ellis | 93,260 | 16,430 | 109,690 | 2,920 | 1,610 | 20 | 17 |
| Area Total | 136,230 | 43,220 | 179,450 | 3,990 | 2,150 | 19 | 16 |
| Fossil | | | | | | | |
| Hardman | 35,810 | 19,180 | 54,990 | 1,680 | 1,090 | 30 | 30 |
| Wall Creek | 110,710 | 100 | 110,810 | 5,160 | 3,360 | 30 | 31 |
| Kinzua | 49,060 | 70,020 | 119,080 | 2,690 | 1,610 | 35 | 33 |
| Area Total | 195,580 | 89,300 | 284,880 | 9,530 | 6,060 | 31 | 31 |
| Forest Total | 600,070 | 452,690 | 1,052,760 | 18,350 | 10,830 | 20 | 18 |