Enclosure with S, D-6, Insect Control, Whitman, 1-25-'13

REPORT

OF THE PRESENT CONDITION

OF INSECT INFESTATION

ON THE

WHITMAN NATIONAL FOREST, [1]

Oregon

By

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Forest Ranger,

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[1] This document was transcribed from a photocopy of the original, which is located in the Supervisor's Office Silviculture Library Archives. To the greatest extent possible, this version is an exact duplicate of the original text.

The object of this report is to give a general idea of the effect of the 1911 insect-control work upon the Whitman National Forest, the present status of the infestation and the increase or decrease of their natural enemies.

The area covered includes the eastern border of the Forest from Wolf Creek, T. 5S., R. 38 E., W. M., south to the summit of the divide, T. 9 S., R. 39 E., W. M., the tributaries of Cracker Creek between Sumpter and Bourne and north from Granite across the North Fork of the John Day River, including Trout Valley and Chicken Creek and Grande Ronde River, T. 6 S., R. 36 E., W. M. Observations on private lands adjoining the Forest were also made as occasion gave opportunity.

No intensive cruise was made of any of these areas, observations being confined to comparisons of infestations of the year with those of previous years or with trees treated in 1911. Sufficient counts were made to determine the approximate percentages and to check former knowledge of these infestations.

Generally speaking the infestation in yellow pine on the area treated in 1911 is as extensive as it was at the beginning of those operations. While there is often striking evidence from broods that escaped destruction in that control work, yet in the time given to the study one is not justified in the conclusion that this new infestation did not come from areas outside adjoining, as much of it probably did. Because the areas worked were chosen in such a way that they were bordered on at least one side, and usually all sides, by untreated more or less infested areas from which the parent adults of the 1912 infestation could have come, and because of the fact that the worked areas do not as a rule exceed four or five miles in width – usually much less and even then with unworked somewhat infested areas adjoining all around – There is no means of determining distances that would aid in controlling insects by the limits of the attacking broods' ordinary flights.

It was commonly noted, however, that where new infestation occurred on the worked areas, the probable host trees from which the attacking broods may have come were found within a radius of 150 to 200 yards and often were adjoining trees, which from all possible evidences were infested in 1911. Occasionally it would be a tree infested 15 to 20 feet from the ground and out of reach of the cruisers and was thus passed up by them, as their axe marks showed, and in some cases evidently the control work was carelessly done, as evidence of abundant infestation by Dendroctonus were found above where the peeling was discontinued. In another instance of a tree cut for Dendroctonus brevicomis, the bark was peeled and piled preparatory for burning but was left unburned. Evidences of the maturing brood having emerged were found in the bark and hard by stood two trees of new infestation of Dendroctonus brevicomis.

Upon the area worked during the first half of the operation apparently no attempt was made at brush disposal, either on or off the National Forest. It is understood that brush disposal was forbidden by members of the Bureau of Entomology and that their instructions were later set aside by Forester's instructions, so that in the last half of the operation brush disposal was satisfactory on National Forest lands.

In several instances there were observations which would tend to indicate that as a rule they do not fly great distances ordinarily. One is an eminence to the north of Dutch Flat Creek, Section 12, unsurveyed T. 7 S., R. 37 E., W. M., from which a bird's-eye view of the mountain flats and slopes across the creek to the south is obtained. Here is seen the black-topped forest on the high lodgepole flats (5500 to 6500 feet) and slopes above them upon which the stand is an almost pure mature lodgepole forest and which was almost completely infested about 1909 and was in the red-top stage at time of the examination and report in 1910. Below this type in the mixed conifers occupying the slopes just below the lodgepole flats is quite a distinct band of red-topped abandoned trees infested in 1911. This band of red tops comprises practically all of the mature lodgepole in the stand. Still below this band of red-topped trees and in which yellow pine becomes prominent in mixture is a more or less irregular band of sorrel tops infested at present. In this lower band the infestation is heaviest next to the red-topped band and extends irregularly downward and into the area worked in 1911 and becomes scattered and spotted further on.

The whole distance from the heart of the 1909 infestation to the present infestation is possibly two miles. Evidently, however, it was checked by the control work of 1911 and has required a year to regain the ground lost to that work, as the infestation on the area is now approximately equal to that destroyed by the control work.

While the yellow pine of all ages is suffering heavily, the lodgepole is much more numerously attacked; in fact, practically all of the lodgepole above six inches D. B. H. is infested or killed. Thus it seems that in this locality, had last years work been well followed up by similar work this spring, the beetles, having destroyed the lodgepole, would have been so thoroughly reduced that here they would have been placed in the normal defensive position, in which, with very little aid, their natural enemies would have retained them. Of course this is assuming that the regions adjoining north and south had been brought under the same conditions.

Somewhat similar conditions of advance, though more extensive and less marked, are noted in the Grande Ronde Watershed, Ts. 5 and 6 S., Rs. 35 ½ and 36 E., W.M. There has been no control work here, however, and the yellow pine, especially in the mixed conifer stands adjoining the lodgepole areas, is now suffering fully as badly as was the case in Powder Valley in 1909 and 1910, which so

materially aided in impressing upon the private holders the thought of impending danger to their interests.

Another instance noted lies north and west of Sumpter. Here the situation may be described as follows: Conceiving the aggressive infestation as advancing southwesterly down the mountain sides from its strongholds in the lodgepole areas high up on the mountain and having reached Cracker Creek by 1911, then set back up the mountain on an average of three miles by the control work of 1910-11, taking refuge in areas untouched and trees overlooked by the control work and in the remaining live trees in the area above. While after the passing of the control work, the beetles have reoccupied the territory from which they were destroyed in practically as aggressive an infestation as previously, they have not advanced beyond the creek to speak of, where the infestation has been reduced to normal by the control work of 1911.

One more instance will be cited, which is also of interest as to yellow pine reproduction. In Sections 8, 9, 16 and 17, T. 6 S., R. 38 E., W. M., is an area that was closely logged 30-35 years ago and much of it was never burned, the rest being burned soon after logging. It is now covered in a most excellent even-aged stand of yellow pine 20-30 years old and 10-20 feet high, averaging 20,000 to 30,000 per acre. It is very healthy and vigorous, growing rapidly. However, it is disheartening to note that fully 25% is either dead or dying from insect infestation, almost wholly Dendroctonus monticolae. The present infestation equals fully one-half of the dead and dying trees.

The method of attack is quite characteristic in reproduction. From a central clump of originally infested trees the infestation spreads in gradually widening concentric circles with each new infestation, until now these areas cover from one to many acres each, some of the closer ones merging. From a point overlooking the area every spot of infestation is most easily picked out by the fading and black-topped colors.

The mature trees on the tract average three to five per acre and scattered here and there are black and broken tops, dead many years, that may be the clue to the origin of the present beetles. There are few mature trees infested at present.

As an illustration of a comparison of the present infestation with the control work of 1911 a cruise of two sections in the Deer Creek Watershed may be given as a good average of the area worked as a whole:

	Infested 1912	Cut 1911 Control
Section 28	16	32
Section 32	49	23
	65	55
Average	32.5	27.5

From knowledge gained in the reconnaissance of 1910 and by observations and studies this spring, with general observations in the interim, somewhat different deductions from those of 1910 present themselves more and more forcibly for consideration.

Previous Depredations.

1. Observations made during the past two years over all parts of the Forest lead to the conclusion that extensive infestations similar in extent and intensity to that of the present have at various times, with long intervening intervals, visited the lodgepole pine forests. This is sustained by the constant presence of the markings of Dendroctonus monticolae on the surface of dead lodgepole, even to the last stages of decay; i. e., the longest dead trees.

2. Many extensive lodgepole deadenings which in the pst have been credited to fires are in reality due to the ravages of Dendroctonus minticolae, as the absence of indications of fires clearly shows in many instances; while in others, the almost entire absence of refuse on burned-over areas indicates a dead and highly inflammable condition of all material present at the time of the fire. Monticolae markings upon small portions of trees and charred remains that escaped the intensity of the conflagration point to the conditions previous to the fire. This is further supported by the observed actual exhibition in 1910 (Ladd Creek Fire) of what may occur under those conditions, a demonstration which is seldom, or never, equaled in similar living forests lacking large percentages of dead timber.

Wherever these large deadenings have occurred they have been replaced by dense even-aged pure stands of lodgepole growing up amid the tangled mass of fallen poles of the former stand, producing the most impassable areas of this region.

3. These infestations have been confined to lodgepole forests, or, if extending into yellow pine, only in mixed forests and then to scattered individuals or groups of trees, as in the case now along the western edge of Powder Valley and the Grande Ronde River. Evidences of

very heavy attacks in pure yellow pine forests are lacking so far as observations have been carried.

4. These infestations after running their course, which may require many years, have waned until only a few scattered trees here and there throughout the forests are attacked from year to year, held in check by their natural enemies until such time as favorable conditions convene for their increase, when another extensive infestation takes place. As in the present case, so in the past, these attacks have covered immense areas. Whether their final reduction is due to an increase of their natural enemies, a developed inherent weakness, or an exhaustion of feeding grounds available in their line of advance would seem to be a question of much interest. The climatic conditions do not seem to have much direct bearing on the question of their growth.

The question of why lodgepole pine as a rule produces such small poles compared with that of Montana and the Rocky Mountains may possibly be answered by these depredations, as these seemingly have occurred about as often as the lodgepole reaches the size most readily attacked, i. e., six inches D. B. H.

From the region covered it seems that the infestation has spread west and southward only slightly in the last two years as compared with accelerated advance of previous years. There is practically no advance from Bald Mountain, T. 8 S., R. 36 E., W. M., south and east beyond what it was in 1911. From this point northwest the advance has been only a few miles, seldom exceeding six, of the line drawn on map of report of 1910. However, that portion now in the Umatilla National Forest and the western part of this Forest have not been covered this spring and may modify the above statement.

Practically all the mature lodgepole pine within the 1910 infestation and 20% of yellow pine in the mixed forests on the headwaters of the Grande Ronde River is now infested or killed. Yellow pine along Sumpter Valley and the west side of Powder Valley is infested as much as in 1910, both that which was worked and which was not. The infestation in other portions of the Forest from what I have seen and hear is no worse than it was in 1910.

To ride through the lodgepole forests in the vicinity of Porcupine Ranger Station, T. 5 S., R. 37 E., W. M., that were infested in 1909-10 gives one the impression of an eastern hardwood forest in the dead of winter. The lodgepole all stands dead and bare, with here and there an occasional green tree of other species, such as larch, fir, etc. The earliest-attacked lodgepole is beginning to fall and it is only a matter of a short time when the great mass of it will fall.

While the infestation that occurred in the summer of 1911 appears to be as intensive and as wide-spread as the preceding years, yet close examinations show material decreases in the broods of this season. A small amount of this may be attributed to climate, such as excessive moisture accumulating under the bark of infested trees in some cases, to drying out in others. But the most apparent cause is disease and attacks by parasites and predators. Since the study of these falls within the province of the Bureau of Entomology, very little attempt was made to learn their nature. Their effects upon the broods were quite conspicuous though, and as a result of observations made it is evident that at least 50% of this year's broods has been destroyed by these means. Numerous counts of eggs hatched and larvae developed from individual egg galleries at various points visited give results of which the following are good averages.

15" D.B.H. Lodgepole, 1 gallery, 56 hatch, 30 developed.
15" D.B.H. Lodgepole, 1 gallery, 97 hatch, 46 developed.
20" D.B.H. Yel. Pine, 1 gallery, 109 hatch, 57 developed.
10" D.B.H. Lodgepole, 1 gallery, 49 hatch, 26 developed.

How many eggs were destroyed is unknown, although it is evident that many were. In those that hatched the larvae usually excavated mines or burrows 1-10 to 1-2 inch, occasionally reaching 1-1/2 and even 2 inches long before dying. However, those that excavated the long mines did not develop normally and in the end died apparently the same as those in the short mines. In these cases the shrunken and desiccated remains of the larvae were usually found at the outer terminals of the mines. Whether this is the result of disease or other cause is not known. This seems to be the most prolific cause of loss to the beetles. Next in effect is some cause that overtakes the larvae when ¼ to ¾ developed and usually nothing but the mine remains to indicate that the larvae has been, although occasionally indications of the larvae's dissolution are evident. Then next was a parasite very minute and visible only under a glass. It is apparently a maggot infesting and reducing the body of the larvae to a semi-liquid mass and finally consuming all but the scales of the head. In a few cases these latter were observed attacking pupae in the early stages of their development. However, after reaching to pupal stage the beetle seems to be much freer of the diseases, etc. Quite often too the larvae mines and pual cells even are filled with white silky filaments probably the mycelium of some fungus. As this is also found enwrapping dead mature beetles it is thought that it may be responsible for some reductions of the beetle's forces.

Predatory and beneficial beetles and insects are much more numerous than was observed in 1910. It was thought that ants might prey upon the Dendroctonus but except as occasion offers access to the broods they can not effectively attack the mature beetles, since the beetles' hard covering shells furnish adequate protection from the bites of ants.

For some cause unascertained the work of woodpeckers so prominent in the summer of 1910 is now quite rare and scattered, although quite common in the winter and early spring. What little bird work was observed during this examination seemed to show that the birds were usually seeking mature beetles and in a few cases pupae of Ips and Dendroctonus, as well as grubs or flatheaded borers.

Dendroctonus brevicomis seems to be in normal or defensive position and losses from its attacks are only a small percent of the total from infestation, but confined to yellow pine.

Dendroctonus valens was found flying as early as June 7 and vigorously attacking the bse of yellow pine that was infested by other Dendroctonus species or had been windblown. Sound and healthy trees were not found being attacked by Dendroctonus valens.

SUMMARY

Control Work 1911

Area almost as badly infested as at beginning of operation, but has been effective check, setting the infestation back fully one year.

Whether it would have been effective in checking an advance into uninfested territory could not be shown, owing to locations of areas worked.

Observations point to comparatively short flights of beetles (Dendroctonus monticolae) generally.

Work apparently often poorly done and only very small amount of brush disposal attempted on National Forest lands during the first half of operations and non at all on private lands.

Extensions of Attacks.

Limits of infestation have advanced only a few miles southwest in two years. Attack has increased to 20% of yellow pine in mixed stands on Grande Ronde River.

Sumpter Valley and west border of Powder Valley infested as bad as in 1910.

Deductions.

The beetles have at prior dates made similar inroads on lodgepole areas.

Deadenings in lodgepole pine forest often due to depredations of beetles rather than fire.

These infestations have not extended into pure stands of yellow pine, although serious in mixed stands.

The present infestation has reached its zenith and is now beginning to decline.

Natural enemies of Dendroctonus monticolae have greatly increased.

Respectfully submitted,

Approved: (Signed) R. E. KAN SMITH

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Supervisor.