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REPORT NO. 70-2-3

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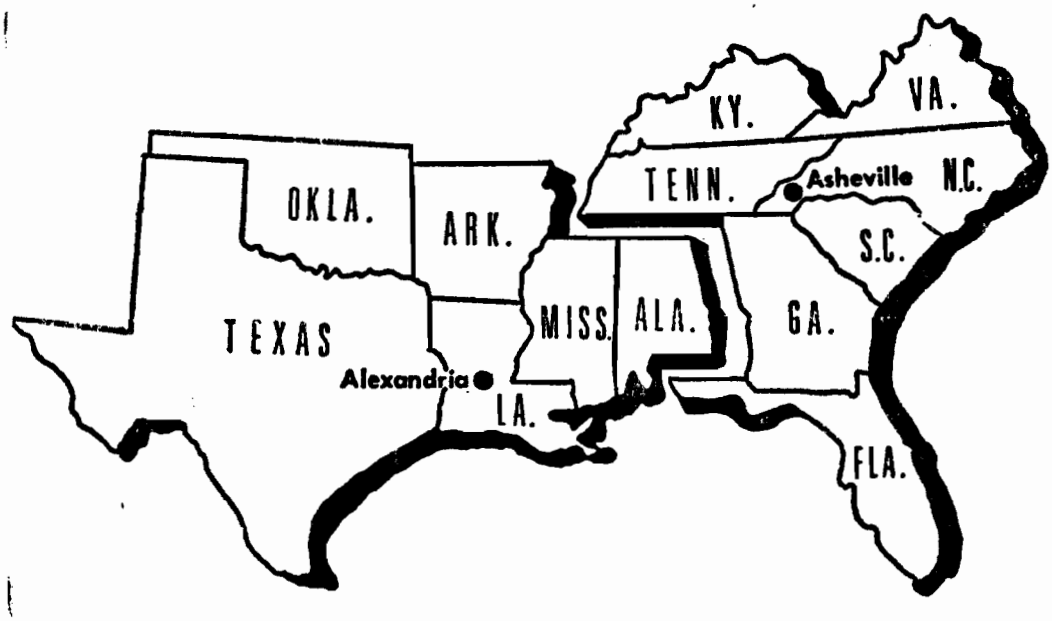
U. S. FOREST SERVICE
Pineville, Louisiana



U. S. DEPARTMENT OF AGRICULTURE - FOREST SERVICE
SOUTHEASTERN AREA, STATE AND PRIVATE FORESTRY
DIVISION OF FOREST PEST CONTROL

REPORT NO. 70-2-3 JULY 1969

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STATUS OF LOBLOLLY PINE DIE-OFF ON THE OAKMULGEE DISTRICT, TALLADEGA NATIONAL FOREST, ALABAMA - 1969

by

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U. S. Forest Service
Pineville, Louisiana

ABSTRACT

Completion of 60 percent of an evaluation to determine the rate of decline and mortality in loblolly pine in west central Alabama has produced results indicating a low rate of decline, and a mortality rate of 0.72 trees per acre per year. Between 1966 and 1969, the condition of 122 trees declined, 103 improved, and 112 remained the same. There was no major build-up in the more affected classes. Thirteen of 338 trees died during the three-year period.

INTRODUCTION

For the past eleven years, "loblolly pine die-off" has been observed affecting loblolly pine, *Pinus taeda* L., on the Oakmulgee and Tuscaloosa Ranger Districts of the Talladega National Forest, Alabama. In February 1966, an evaluation of 24 die-off plots was initiated on the Oakmulgee District by the U. S. Forest Service, Division of Forest Pest Control. The purpose of the evaluation is to determine the rate of decline and mortality of the trees over a five-year period.

The first die-off progress report was prepared in 1966 (Anonymous, 1966). In 1968, a second progress report including historical background, methods, soil series identifications and interpretations, soil assay results, and results of the first three annual

die-off evaluations was prepared (Brown and McDowell, 1968). This present report involves the results of the evaluation made in February 1969. The reader is referred to the 1968 report for additional information.

METHODS

A District map and aerial photographs were used to locate the plots. Initial plot information was used to determine numbers for each dominant and co-dominant pine. One typical terminal branch was shot out of the upper-third of the crown of each dominant and co-dominant pine in each plot. The terminal portion of the branch was examined for needle color, and measured for needle length and needle retention. Observed disease or insect damage to the branch was recorded and the damaged specimens were collected for identification. Damage to and mortality of individual pines were recorded, including cause when known.

RESULTS

During the 12-month period between February 1968 and February 1969, the overall condition of the trees improved; 130 trees were classed as healthier, 117 remained the same, and 90 were classed as less healthy, including four dead. The number of trees in Class 1 (healthy) increased 24%; Class 2 (lightly affected) increased 16%; Class 3 (moderately affected) decreased 32%; Class 4 (severely affected) decreased 26%; and Class 5 (dead) increased 40% (Fig. 1). Since the evaluation was initiated in 1966, the overall condition of the trees has decreased slightly; 103 have been classed as healthier, 112 remained the same, and 122 have been classed as less healthy. Between 1966 and 1969, the number of trees in Class 1 decreased 24%; Class 2 increased 50%; Class 3 decreased 16%; Class 4 decreased 56%; and Class 5 increased 1300% (from 1 to 13 trees) (Fig. 1). Data for each class in each plot from 1966 through 1969 is listed in Table 1.

The average condition of 14 plots decreased over the three-year period. However, in 11 of these plots the decrease was less than one class; e.g., Plot 1 decreased from 2+ to 2, or one-third of one class (Table 2).

As stated in the introduction, the objective of this evaluation is to determine the rate of decline and mortality of the die-off plots over a five-year period. Thus far, with 60% of the evaluation complete, results indicate a low rate of decline. As of February 1969, there were less trees in Class 3, less in Class 4, and, overall, nineteen more trees declined than improved during

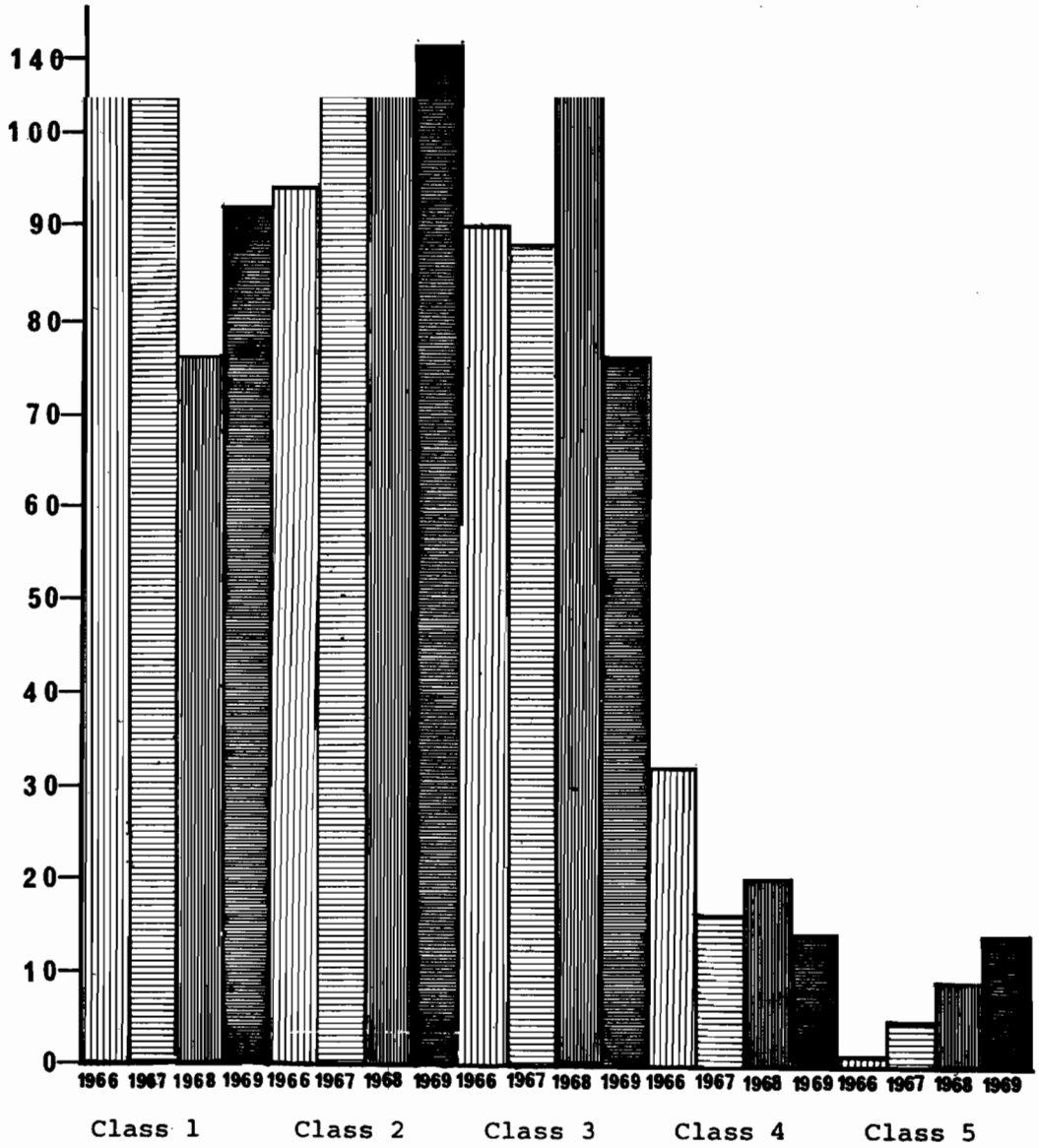

Fig. 1 Symptom Classification of 337 Loblolly Pine in 24 Die-off Plots, Oakmulgee District, Talladega National Forest, Alabama: 1966-1969

TABLE 1. SYMPTOM CLASSIFICATION OF TREES IN EACH LOBLOLLY PINE DIE-OFF PLOT, OAKMULGEE DISTRICT, TALLADEGA NATIONAL FOREST, ALABAMA: 1966-69

Plot	No. Trees	Class 1				Class 2				Class 3				Class 4				Class 5			
		66	67	68	69	66	67	68	69	66	67	68	69	66	67	68	69	66	67	68	69
1	12	6	2	0	3	5	7	6	8	1	3	6	0	0	0	0	1	0	0	0	0
2	14	5	4	0	9	4	5	4	3	4	4	9	1	1	0	0	0	0	1	1	1
3	16	6	3	1	1	2	6	7	5	3	5	6	9	5	2	2	1	0	0	0	0
4	8	2	3	1	0	2	3	3	7	2	2	4	1	2	0	0	0	0	0	0	0
5	15	7	5	0	0	2	5	3	6	3	4	11	5	2	0	0	3	1	1	1	1
6	21	5	8	5	5	10	2	5	7	6	7	9	9	0	3	2	0	0	1	0	0
7	11	4	0	1	6	3	8	7	4	4	3	3	1	0	0	0	0	0	0	0	0
8	13	2	0	1	1	4	6	4	1	5	3	5	5	2	4	0	1	0	0	3	5
9	19	6	9	6	11	7	7	7	7	4	3	6	1	2	0	0	0	0	0	0	0
10	9	4	3	2	1	3	3	3	6	2	3	4	1	0	0	0	0	0	0	0	1
11	12	3	4	4	5	3	6	6	6	3	1	2	0	3	1	0	1	0	0	0	0
12	4	2	1	1	0	0	0	1	2	2	3	1	1	0	0	0	0	0	0	1	1
13	21	10	13	10	10	5	4	9	10	6	3	2	1	0	1	0	0	0	0	0	0
14	19	3	7	5	5	9	7	12	10	5	4	0	3	2	1	2	1	0	0	0	0
15	11	1	2	5	0	4	7	2	5	4	2	3	6	2	0	1	0	0	0	0	0
16	28	16	16	7	8	9	8	10	15	2	4	9	4	1	0	1	0	0	0	1	1
17	23	7	5	1	3	6	6	10	6	8	12	11	12	2	0	1	2	0	0	0	0
18	6	2	5	3	2	2	1	3	4	2	0	0	0	0	0	0	0	0	0	0	0
19	14	9	8	7	8	2	3	6	6	3	3	1	0	0	0	0	0	0	0	0	0
20	10	4	3	2	1	3	5	5	9	2	2	3	0	1	0	0	0	0	0	0	0
21	14	7	10	7	11	3	4	5	3	4	0	2	0	0	0	0	0	0	0	0	0
22	16	7	1	3	1	3	7	0	6	4	6	8	6	2	1	4	2	0	1	1	1
23	9	1	0	3	1	0	1	1	4	6	6	1	3	2	2	4	1	0	0	0	0
24	12	2	2	1	0	3	4	3	1	5	5	5	7	3	1	2	1	0	1	2	3
TOTAL	337	121	114	76	92	94	115	122	141	90	88	111	76	32	16	19	14	1	5	10	14

No.					Trend
1	2+	2	2-	2	N (Negative)
2	2+	2	3+	2+	None
3	2-	2-	3+	3+	N
4	2-	2+	2	2-	None
5	2+	2	3+	3+	N
6	2+	2	2-	2	N
7	2+	2-	2	2+	None
8	2-	3+	3	4+	N
9	2+	2+	2	2+	None
10	2+	2	2	2-	N
11	2-	2	2	2	P (Positive)
12	2	3+	3+	3+	N
13	1-	1-	1-	2+	N
14	2	2+	2	2	None
15	2-	2	2	3+	N
16	1-	1	2-	2	N
17	2	2-	2-	3+	N
18	2+	1-	1-	1-	P
19	1-	1-	2+	2+	N
20	2+	2	2-	2+	None
21	2+	1	2+	1	P
22	2	3+	3	3+	N
23	3+	3	2-	2-	P
24	2-	3+	3	4+	N

the three-year period. Thirteen trees died in the three years at a near constant rate of four per year. Based on 24 one-quarter acre plots, the annual mortality rate has been 0.72 trees per acre.

Decline rate, as the above results show, has varied from year to year in both plots and classes. This was not as evident through 1968 when a trend toward the light and moderate classes and away from the healthy and severe classes was developing. However, after the addition of 1969 data, only one definite trend remained; that being an annual increase in Class 2 trees.

DISCUSSION

It is not understood why this variation of foliar symptoms exists from year to year. The sampling procedure has been checked frequently throughout each evaluation. Typical branches of each tree are examined. In 25 percent of these trees, the field personnel estimate the length of retention and needles before the branch is shot down. Over 90 percent of the time, the estimate has been within ±0.2 inches of the actual measurement.

No important insect activity has been observed in the plots except for a few infestations (two trees in 1969) by the black turpentine beetle, *Dendroctonus terebrans*, (Hodge and Hunt). The observable fluctuation of foliar symptoms is not typical of any important pine diseases in the South. Possibly this fluctuation or variation is closely associated with weather conditions. Examination of the Centreville, Alabama weather data after the evaluation is completed may indicate such a relationship.

RECOMMENDATIONS

In addition to the recommendations made in the 1968 Progress Report, the following are suggested:

1. During the final evaluation in February 1971, obtain five-year increments from approximately 50 percent of the trees for rate of decline information.

2. After the final evaluation, examine the weather data on Centreville, Alabama for the 1966-1971 period and report any probable correlations between weather conditions and die-off.

Alabama - 1968, U. S. Forest Service, S&PF, Division of of Forest Pest Control, Pineville, Louisiana.

For more detailed information, contact the Division of Forest Pest Control Field Office listed below or the Atlanta Office.

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