ESTABLISHMENT REPORT

LONGLEAF PINE SEED PRODUCTION

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Silviculture of Longleaf Pine

FS-SO-1103-1.32

Establishment Report Summary
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LONGLEAF PINE SEED PRODUCTION

This study was initiated on the Escambia Experimental Forest in the spring of 1964. The principal objective is to explore relationships between longleaf pine flowering, flower and cone losses, and seed production and environmental factors such as weather conditions and individual stand and tree characteristics.

The study was superimposed entirely on the existing Preparatory Cuts Study (FS-SO-1103-1.16) and no additional installations were required. However, two of the ten study plots were destroyed by a tornado on April 26, 1964. Two replacement plots were established in the same area in May 1964.

LONGLEAF PINE SEED PRODUCTION

INTRODUCTION

Erratic seed production is one of the major natural regeneration problems of longleaf pine (Pinus palustris Mill.). Very few seed crops are large enough to satisfy the many seed predators and still produce an acceptable seedling stand.

This study was established in the spring of 1964 to accumulate long-term records on longleaf pine flowering, flower and cone losses, and cone and seed production, and explore relationships between these and environmental factors such as weather, and individual stand and tree characteristics. The results may reveal some of the causes for the high year-to-year variation in longleaf pine cone production, and also suggest what silvicultural treatments might improve seed yields.

The study was superimposed entirely on the existing Preparatory Cuts[1/] study, and no additional plot establishment was necessary. Details on plot locations and layout are given in the plan of the study[2/] and will not be repeated here. However, two of the ten study plots were destroyed by a tornado on April 26, 1964. The establishment of two replacement plots is documented in this report.

1/ Boyer, W. D. Preparatory Cuts. 1957. (Unpublished study plan, FS-SO-1103-1.16, South. Forest Expt. Sta.)

2/ _____ Longleaf Pine Seed Production. 1964. (Unpublished study plan, FS-SO-1103-1.32, South. Forest Expt. Sta.)

OBJECTIVE

The major study objective is to explore some of the factors affecting longleaf pine seed production through long-term records of:

1. Cone and seed production by stands of different densities, and individual trees within stands.

2. Time and abundance of flowering of male and female flowers.

3. Annual losses of flowers and cones.

ESTABLISHMENT

This study was superimposed on an existing study, so additional plots were not needed. However, this study required that all net plot trees be numbered and measured. From these, four trees were selected for close observation of flower fate on sample twigs. All trees were numbered and measured, as required, between November 1963 and February 1964. The first examination of flowers and conelets on selected trees and twigs was made in April 1964.

A tornado during the night of April 26, 1964, destroyed plots A-1 and A-2, and downed two net plot trees in plot A-3. Therefore, in May 1964, new plots were established, as a part of the Preparatory Cuts study, to replace the original plots A-1 and A-2. There were no establishment costs, as all plot location was done under the parent study.

LOCATION AND LAYOUT

This study is located in 50- to 60-year-old second-growth longleaf pine stands, on the Escambia Experimental Forest, Escambia County, Alabama. The parent study consists of ten, square, 2.5-acre plots. Stand densities of 9, 18, 27, 36, and 45 square feet of basal area per acre were randomly assigned among five plots in each of two blocks. Plots were cut to their prescribed densities in March 1957.

Replacements for plots A-1 and A-2 were established in May, 1964, as noted earlier. Replacement plots A-1 was established in Compartment 44 of the Experimental Forest. The northeast corner of the 5-chain square gross plot bears S50°W, distance 5.09 chains from the northeast corner post of Compartment 44. Replacement plot A-2 was established in the northeast corner of Compartment 53, and the northeast corner of the compartment also forms the northeast corner of the 5-chain square gross plot. Plot borders are oriented in the cardinal directions. Present locations of all study plots are shown in figure 1. Pertinent stand data are given in table 1. These data were obtained in February 1962 for all but the two replacement plots, which were measured in May 1964.

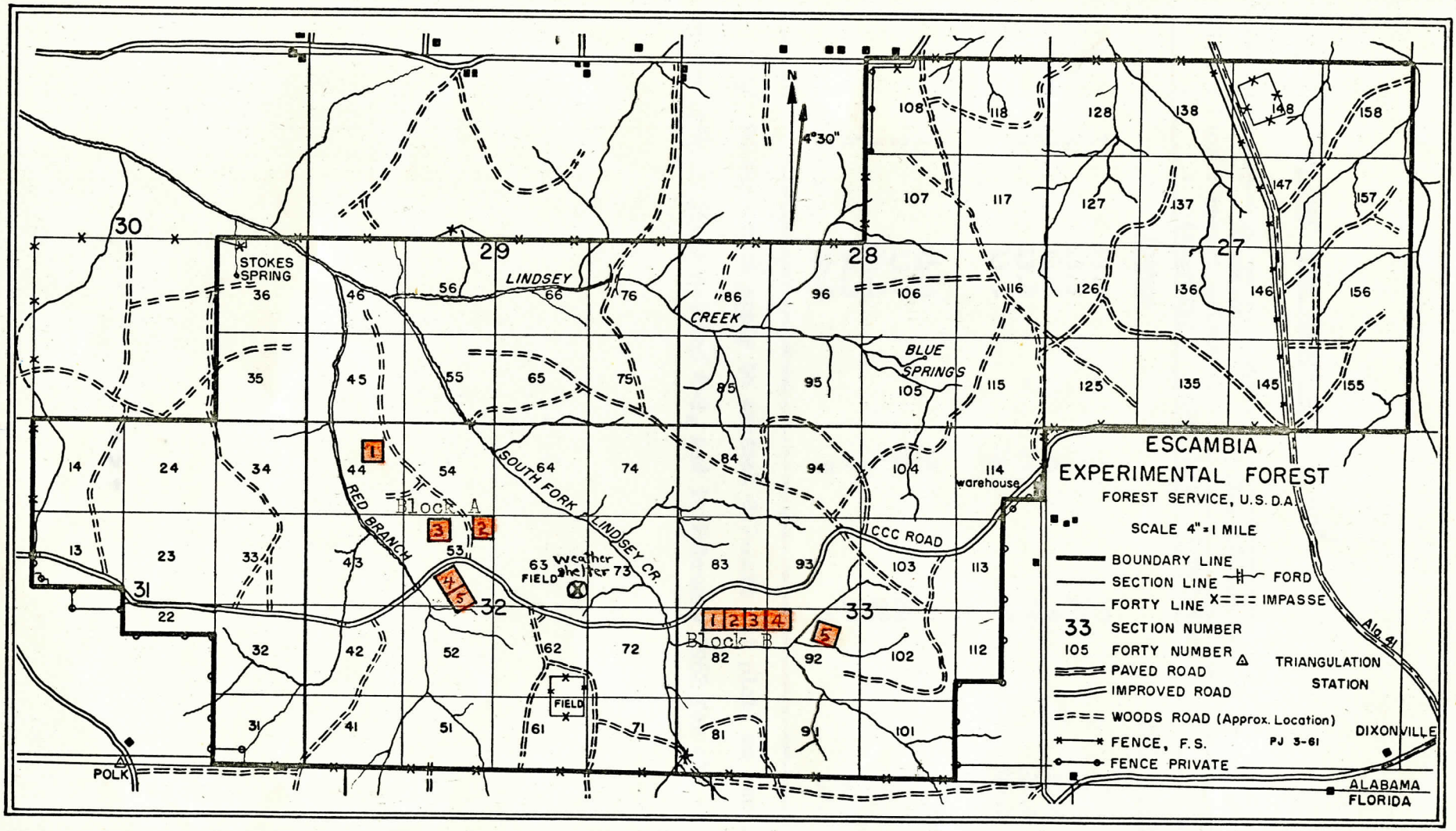

Figure 1.--Location of study plots.

Table 1.--Longleaf pine timber stand data[1/]

Block	Plot	Diameter breast height (average)	Number of trees per plot	Number of trees per acre	Basal area per acre
		Inches			Square feet
A	1	13.4	27	30	30.3
	2	13.3	18	20	19.9
	3	14.6	8	9	10.5
	4	13.8	33	37	38.6
	5	13.5	44	49	49.4
B	1	14.8	15	17	20.2
	2	13.7	40	44	46.6
	3	14.1	24	27	29.5
	4	14.3	32	36	40.1
	5	14.5	8	9	10.4

1/ Measurements apply to central 0.9-acre net plot, as recorded in May 1964 on plots A-1 and A-2, and in February 1962 for all others.