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Determining Survival in Young Slash, Loblolly, and Longleaf Pine Stands after a Fire in Bulloch County, Georgia

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INTRODUCTION

Prescribe fire is a valuable forest management tool for Southern pine stands. When applied early and executed by skilled professionals, a prescribed burn produces favorable results in pine stands by:

1. Reducing the fuel load and thereby reducing wildfire potential;
2. Near-term reduction of woody midstory and understory hardwood species, and improving browse quality for deer and other wildlife;
3. Increased stand visibility and aesthetics;
4. Releasing nutrients from a bound organic form to available mineral forms; and
5. Manage for ecologically sensitive species.

Fire is unpredictable! The best weather forecasting and a thorough burn plan does not insure everything will go as planned. A prescribed fire can quickly go from controlled to uncontrolled. Factors most likely to lead to uncontrolled burning are:

1. Unanticipated weather changes (wind speed and direction, humidity, temperature, etc.);
2. Inadequate or non-existent fire breaks; and
3. Insufficient number of people and equipment working the burn (back firing and mop up).

This is one account of an incident where a prescribe fire in a 5-year old longleaf CRP stand jumped a fire break and ran through an adjacent young slash pine stand that had not ever been burned. There was a high level of fuel (woody debris and dead vegetation) in the windrows and throughout the stand.

The prescribe fire was started early in morning on March 4, 2006. The landowner thought the fire was well contained, but later that day realized that the fire had jumped a firebreak and entered his unburned 8-year-old slash pine stand and took off at an uncontrollable pace. The local fire station was called to the scene but could do little but stop the fire from spreading. Pine crowns are vulnerable to temperatures greater than 135^{o} F , so fire intensity, wind speed, and time of year when fire occurred can influence pine survival.

RESULTS

The first growing season after an unintended fire is critical and will provide evidence of the extent of fire damage. As a forest landowner who has suffered a similar situation in a young

slash, longleaf, or loblolly pine stand, the following offers a few guidelines to follow to help you determine survival rate:

Assess the Damage

Ask the question, "Were the majority of the needles burned off the trees or blackened (needle consumption), or were they scorched, turned brown, but remain on the branches (needle scorch)? Generally, if the needles are browned, but the terminal buds are not damaged and are pointing straight up, then the trees have a greater chance of surviving. Photo 1 was taken 4-weeks after the fire.

Photo 1

Signs of Growth

After a fire that causes damage similar to that shown in Photo 1, you should check the stand every 2-3 weeks looking for signs of new growth. Trees exhibiting new shoot (upright vs bent over) and needle growth have a greater potential for surviving. Active growth indicates the conductive tissues of the trees were not severely damaged by the fire. Photo 2 was taken 5 months after the fire.

Photo 2

Surviving the Fire

One year after the fire, the slash pine stand shows very little mortality. The foliage and shoot growth are good. A drawback to the fire is that the stand will probably loose one year of growth. However, the positive impact of the fire is the trees will be better pruned in the first 8 feet, the understory vegetation has shifted to favor more nutritious browse, and fuel levels were greatly reduced minimizing the probability of a wildfire. Photo 3 was taken one year after the fire.

Photo 3

Uncontrollable Factor

The amount and frequency of rainfall after a fire has a tremendous impact on survival and growth of the trees that were scorched. Evident from Figure 1, the rainfall data for the surrounding area was below the 50 year average, yet the trees survived.

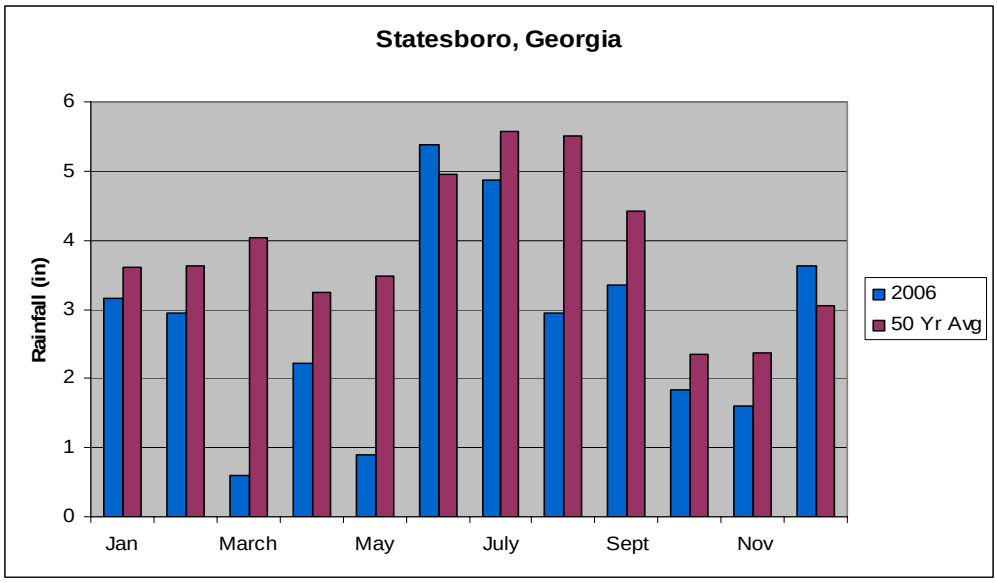

Figure 1. Statesboro, Georgia weather station rainfall patterns for the year 2006 and 50 year average.

OTHER CONCERNS

Once into the summer and fall look for any signs of bark beetle infestation. Most likely Ips beetle (Photo 4) will be the pest in the Coastal Plain and the Southern Pine beetle (Photo 5) will be the problem in the Piedmont as evidenced by trees turning red-topped in a 1 to 2 week period.

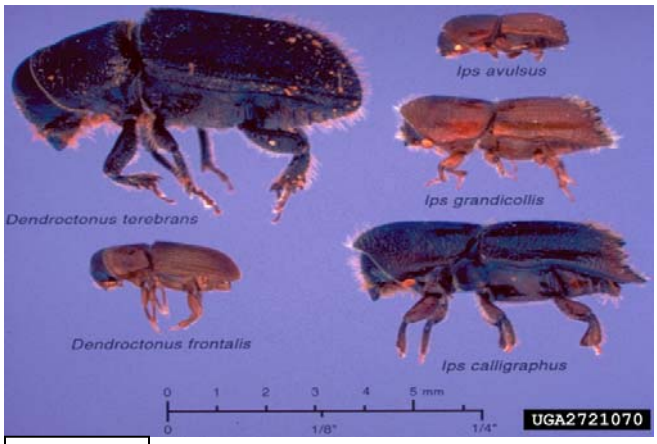

Photo 4

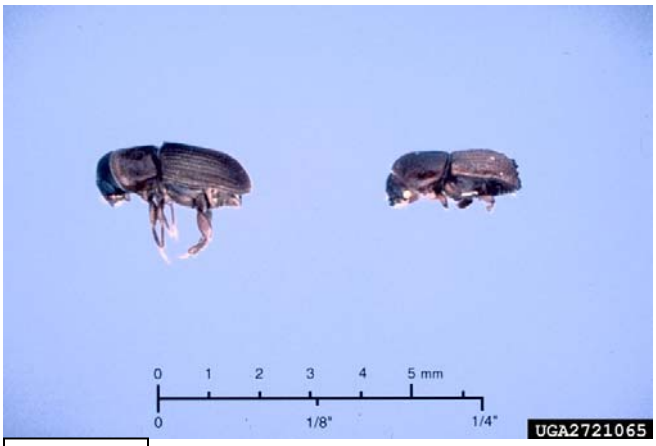

Photo 5

FINAL DECISIONS

If mortality is low (estimated to be less than 3% in this case) by the end of the first year after a wildfire, then the stand can be carried to maturity. However, if the total number of remaining trees is less than 300 to 350 well spaced per acre then the issue becomes whether or not to start over or keep the stand and manage it through to final harvest. The decision depends on several factors. The first factor to consider is your objectives. What do you want from this stand? Other factors include stand health, vigor and insect or disease incidence in the stand. Working with your County Extension Agent, Forestry Extension Specialist, GA Forestry Commission Forester, or a consulting forester will help you make the final decision about your forest and its future.

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CITATION

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