

Final Report
JOINT FIRE SCIENCE PROGRAM

TITLE OF PROJECT: Frequency and Season of Prescription Fires to Reduce Hazardous Fuel Loads on the Lower Piedmont of Georgia: Establishing a demonstration area on a 12 year old study:

PROJECT LOCATION: Hitchiti Experimental Forest, Juliette, GA.

JFSP PROJECT NUMBER: 01B-3-1-05

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SUMMARY OF FINDINGS:

Burning will not reduce midstory hardwoods.

Prior to treatment, plots were dominated by loblolly pine with a significant midstory of hardwoods. Control plots have changed very little although there has been some natural thinning of hardwood saplings. None of the treatments have reduced midstory hardwoods, although it appears the 2 year dormant burns are keeping them in check. Thus, mechanical or chemical treatments will be necessary to reduce this component from Red Cockaded woodpecker (RCW) stands.

Burning does not affect Overstory Pine.

A major concern of managers is retention of large overstory pine for RCW. Pine basal area declined in all stands because of mortality from southern pine beetles, but prescribed burning did not significantly affect mortality. Thus, burning did not cause additional overstory pine mortality but neither did it reduce mortality. Therefore, managers will need to thin these stands to keep residual trees healthy and reduce the risk of beetle caused pine mortality.

Even infrequent burning will control hardwood saplings.

The first burn in 1989 reduced saplings significantly and this decline has continued with significantly lower density on all burned treatments compared to non-burned control areas. The initial low intensity but high severity backing fire was very effective at top-killing hardwood saplings. Continued application of biennial dormant season burns has nearly eliminated hardwood saplings. Thus, this fire regime could be used to keep this component in check and eliminate recruitment into the midstory.

Burning temporarily reduces woody cover in the understory.

All burn treatments reduced understory woody cover, but there is some recovery between fires. Because of the long return interval the 6 year burn cycle allows woody cover to rebound to pretreatment levels. Thus, 6 years appears too long, although 3 or 4 maybe acceptable for maintenance burning.

Burning will increase understory herbaceous cover.

All burned treatments had significantly more herbaceous cover than the unburned control, with the dormant season head fires showing the greatest effect. Herbaceous cover will decrease the first growing season immediately following a burn, but then it quickly recovers. Thus, an herbaceous dominated ground cover can be obtained with dormant season headfires every 2 or 3 years even without removal of the midstory hardwoods. Therefore, midstory removal is not necessary to reduce wildfire hazard or improve health of the understory.

Managers have options.

Burning every 3 or 4 years is sufficient to keep fuel loads down and reduce wildfire hazard. This is the only treatment needed to maintain stands with overstory pines, midstory hardwoods, and herbaceous dominated understory. If managers want to create RCW habitat then they need to thin overstory, remove midstory, and burn on a regular basis. Both growing season and dormant season burns can be used in this forest ecosystem. Growing season burns, however, need to be in the early growing season as fuel moisture and humidity is just too high to get good burns after June 1.

PROJECT OVERVIEW: BACKGROUND

Frequent burning of Piedmont forests by Native Americans maintained pine dominated stands, favored oak regeneration over other hardwoods, and kept understories open. From 1950 to 1990, fire was quite infrequent in this region, which resulted in a gradual replacement of pines with hardwoods. More recently, however, prescribed burning has been used much more extensively to restore open pine stands for key species like red-cockaded woodpeckers. We know burning maintains open pine forests and reduces fuels and thereby the chance of damaging wildfires. The silvicultural effects of burning at different frequencies and in different seasons, especially in stands that have a significant hardwood component and very little herbaceous understory, are less well understood. To determine the effect of prescribed burning regime, i.e. season and frequency, on overstory and understory composition, a series of plots were established in 1987 on the Hitchiti Experimental Forest in central Georgia.

APPROACH

Researchers are examining responses to 6 different treatments consisting of: dormant season burns every 2 years with headfires, dormant season burns every 3 years with headfires, dormant season burns every 3 years with backfires, growing season burns every 3 years with headfires, growing season burns every 6 years with headfires, and an unburned control. A series of these treatment plots have been installed in a representative stand of naturally regenerated 80+ year old

loblolly pine (*Pinus taeda*). The effect of these treatments on composition and structure of the plant community is being tracked by periodic measurements and surveys. Because of there location along a major road and adjacent to a popular hiking trail, the plots are being used to demonstrate the effects of prescribed burning to the public.

DELIVERABLES:

Proposed	Delivered
Annual Progress Reports	Progress Reports completed annually.
Pre and Post burn fuel and vegetation data collected and summarized.	All data collected and summarized. Date was used for presentation and publication in press. Outcalt, K.W. 2006. Managing composition of piedmont forests with prescribed fire. In: Proceedings 13 th Biennial Southern Silvicultural Research Conference, February 28 to March 4, 2005, Memphis, TN. An additional publication is in preparation and will be submitted to an appropriate Journal.
Erect signs on one replication of study along major road.	Signs placed on all plot including those along road and hiking trail that goes through the area.
Erect permanent display board about study and prescribed burning.	Permanent display board constructed at parking lot to trail adjacent to burn plots.
Create take home sheet for visitors to Display	Created and available at Display
Create web page describing area and study results	Web site created and updated as new information became available (http://www.srs.fs.usda.gov/hitchiti)
Field day at Demo area	Conducted 1day tour in March 2003. Tours continue, as the Hitchiti is a demonstration forest with an on-site manager employed to provide outreach and tours to interested groups. He conducts an average of 5 tours per month for various groups including foreign scientist, students, state and federal employees, garden clubs, etc. The burning study is a featured stop on these tours.

PRODUCTS ON CD:

- Handout front and back
- Poster left, right and middle sections
- Picture of poster