

Forestry, Wildlife and Fisheries Graduate Seminar
"Changes in Community Characteristics
Associated With Oak Savanna Restoration"



Presented by: Seth Barrioz
Wednesday, 27 February 2008
12:20 P.M.
125 PSB

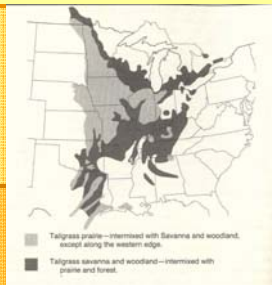


Outline

- Introduction
- Justification
- Purpose
- Objectives
- Study Sites
- Experimental Design/Methods

Introduction

- Historically, oak savanna habitat covered > 11 million ha (Nuzzo 1986)
- Currently < 1% of this habitat remaining (Noss and Peters 1995)



Reasons for Decline

- Agriculture Development



Declining Populations



Justification

- Few Studies have examined the change in vegetation and avian communities when fire and canopy removal are implemented to restore an oak savanna (Abella et al. 2001, Nielsen 2003)

Purpose of Research

To determine the effects of fire and canopy removal on herbaceous, woody, and avian communities.

Objectives

Herbaceous Vegetation

- 1. Determine grass, forb, legume composition as a function of canopy and fire disturbances.
- 2. Determine trends in focal species composition as a function of canopy and fire disturbances.
- 3. Determine which disturbance level optimize native warm-season grass coverage.

Woody Vegetation

- 1. Evaluate the number of oak seedlings as a function of canopy and fire disturbance.
- 2. Determine species composition of the shrubs within the shrub layer as a function of canopy and fire disturbance.

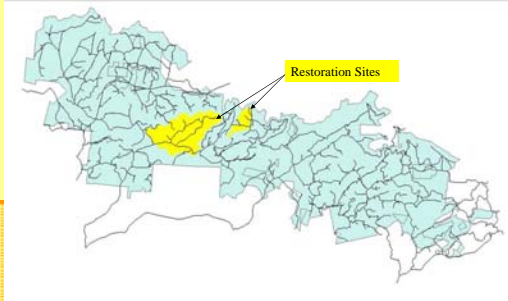
Avian Community

- 1. Determine breeding bird use as a function of canopy and fire disturbance.
- 2. Determine species diversity as a function of canopy and fire disturbance.
- 3. Relate breeding bird use to habitat conditions across the disturbance levels.

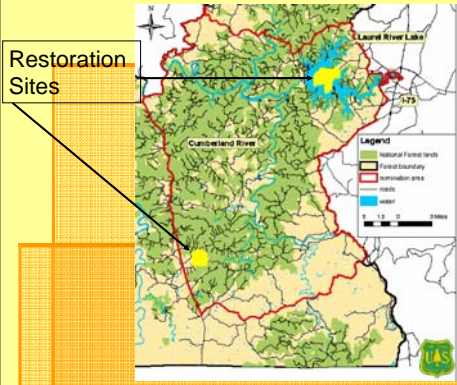
Study Sites



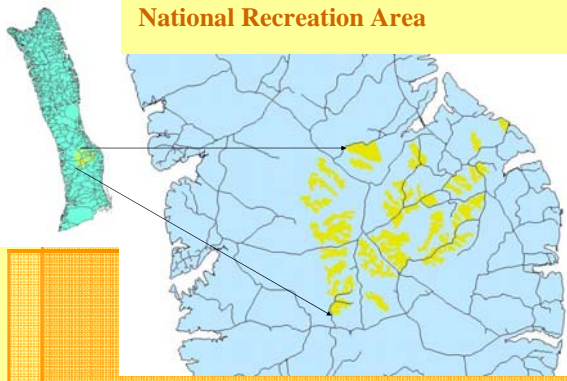
Catoosa Wildlife Management Area



Daniel Boone National Forest



Land Between the Lakes National Recreation Area




Methods

Experimental Design

Nine Disturbance Levels with Twenty Replicates Each

- Control (3 sites)
- Burn only (2 sites)
- Cut and Unburned
- Cut and Three Burns
- Cut and Five Burns
- Cut and Five Burns with Drum Chopping



Experimental Design

- Disturbance level will be 40 ha in size
- Only the inner 20 ha of each unit will be sampled for both (vegetation and avian community), to avoid any edge effects

Methods

Herbaceous Vegetation Objectives

- Use 20 50-m point intercept transects per disturbance level
- Focal species identified at one meter intervals
- At each interval, species will be categorized as being either grass, forb, or legume
- Transects 100 m apart

Focal Species

Grass	Little Bluestem	<i>Schizachyrium scoparium</i>
	Big Bluestem	<i>Andropogon gerardii</i>
	Broomsedge Bluestem	<i>Andropogon virginicus</i>
	Indiangrass	<i>Sorghastrum nutans</i>
	Panicum spp.	<i>Panicum spp.</i>
	<i>Dichanthelium spp.</i>	
Forb	<i>Aster spp.</i>	
	Spanish Needles	<i>Bidens bipinnata</i>
	<i>Eupatorium spp.</i>	
	<i>Salidago spp.</i>	
Legume	<i>Desmodium spp.</i>	
	Slender Lespedeza	<i>Lespedeza virginica</i>
	Partridge Pea	<i>Chamaecrista fasciculata</i>
	Illinois Bundleflower	<i>Desmanthus illinoensis</i>
	Creeping Lespedeza	<i>Lespedeza repens</i>
Invasive	Serecia Lespedeza	<i>Lespedeza cuneata</i>
	Shrubby Lespedeza	<i>Lespedeza bicolor</i>
	Multiflora Rose	<i>Rosa multiflora</i>

Methods

Woody Vegetation Objectives

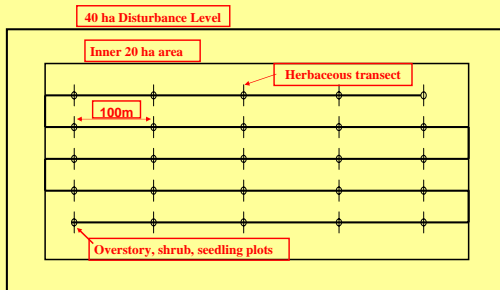
- 20 Plots per disturbance level, nested within the herbaceous transect
- Seedlings will be counted by species within a 1 m² at plot center
- Shrubs and Saplings will be counted by species within a 3m (0.002 ha) radius around the plot center

Methods

Woody Vegetation Objectives cont.

- Overstory trees and snags will be tallied by 2" DBH class within a 11.3m (0.04 ha) radius around the plot center
- Basal area will be measured using a 10-factor prism
- Canopy coverage will be measured using a spherical densiometer

Plot Layout



Methods

Avian Community Objectives

- Conduct point counts throughout each disturbance level
- 250-m distance between each points
- All birds seen and heard within three distance intervals will be recorded within a 10-minute period
- All point counts will follow the standard point count protocol

Analysis

- Shannon's diversity index will be used to determine diversity for shrub and avian species
- ANCOVA
 - Test statistical differences between disturbance levels
- Linear Regression
 - Test the relationships of various canopy coverage's to the dependent variables

Dependent Variables

- Grass Composition
- Forb Composition
- Legume composition
- Focal Species composition
- Number and species of seedlings
- Shrub and sapling numbers and species composition
- Number of snags
- Avian species richness
- Avian species diversity

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