# Woodland Stewards Webinar Series
## Session 4: Wildlife and Woodlands

Audio starts at 7PM Eastern (6PM Central)

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WOODLAND STEWARDS
A Regional Extension Program for Landowners

Session 4 Moderator
Dr. Robert Bardon
NC STATE EXTENSION

*The Woodland Stewards Webinar Series was created by a team of Extension professionals from the following programs:*

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# Wildlife and Woodlands

Dr. Craig A. Harper

UTEXTENSION INSTITUTE OF AGRICULTURE THE UNIVERSITY OF TENNESSEE

Dr. Mark McConnell

MISSISSIPPI STATE UNIVERSITY EXTENSION

WOODLAND STEWARDS

A Regional Extension Program for Landowners

## Why and how do we manage wildlife and wildlife habitat?

To manipulate populations of various wildlife species

- **directly adjust the structure and level of populations**
- **influence their habitat through various management practices**

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Concentrate on populations, not individuals

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Concentrate on populations, not individuals

Understand this:

> ***The most basic principle of wildlife management is to provide and maintain the appropriate vegetation types and successional stages in a suitable arrangement for the desired wildlife species. –C.A. Harper***

# What is habitat?

The ***collection of resources*** within adequate space required to support a ***particular wildlife species*** (species specific)

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- **an area either is or isn't! Habitat quality may vary (low to high)**
- **habitat quality influenced by resource amount and arrangement**


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**"**Habitat**"** not synonymous with **"**vegetation**"**

There is no such thing as "habitat type"

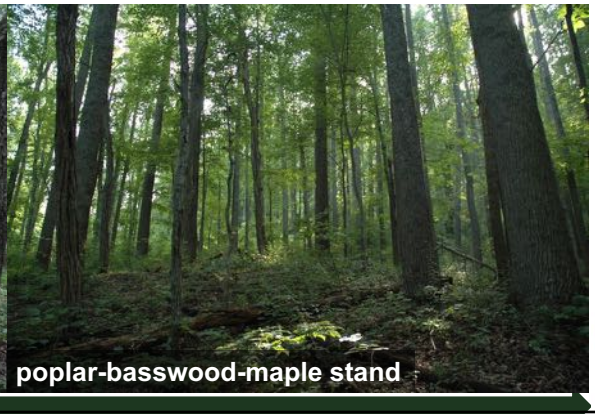
- **what you mean to say is "vegetation type"**

# What is a vegetation type?

An area dominated by vegetation species often found in association with each other (species assemblages)

Most recognized incl various forest types, shrub/tree thickets, and grasslands


oak-hickory stand


poplar-basswood-maple stand

## What is a vegetation type?

An area dominated by vegetation species often found in association with each other (species assemblages)

Most recognized incl various forest types, shrub/tree thickets, and grasslands

tall fescue

broomsedge / little bluestem / purpletop

## Succession

Orderly progression of change in plant community composition

Various wildlife species require specific stages of succession

Succession is managed through disturbance (set-back) or planting (accelerate)

fallow crop field – 1st successional stage, July 2006

# Succession

Orderly progression of change in plant community composition

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fallow crop field – 2nd successional stage, July 2009

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Orderly progression of change in plant community composition

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broomsedge / little bluestem / purpletop

goldenrod / old-field aster / boneset

fallow crop field – 2nd successional stage, July 2009

# Succession

Orderly progression of change in plant community composition

Various wildlife species require specific stages of succession

Succession is managed through disturbance (set-back) or planting (accelerate)

2nd successional stage w 3rd encroaching

# Succession

Orderly progression of change in plant community composition over time

Various wildlife species require specific stages of succession

Succession is managed through disturbance (set-back) or planting (accelerate)

3rd successional stage – forest developing

# Succession

Orderly progression of change in plant community composition

Various wildlife species require specific stages of succession

Succession is managed through disturbance (set-back) or planting (accelerate)

3rd successional stage – eastern redcedar

# Succession

Orderly progression of change in plant community composition

Various wildlife species require specific stages of succession

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forest from 3rd successional stage

# Succession

Orderly progression of change in plant community composition

Various wildlife species require specific stages of succession

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3rd successional stage – VA pine

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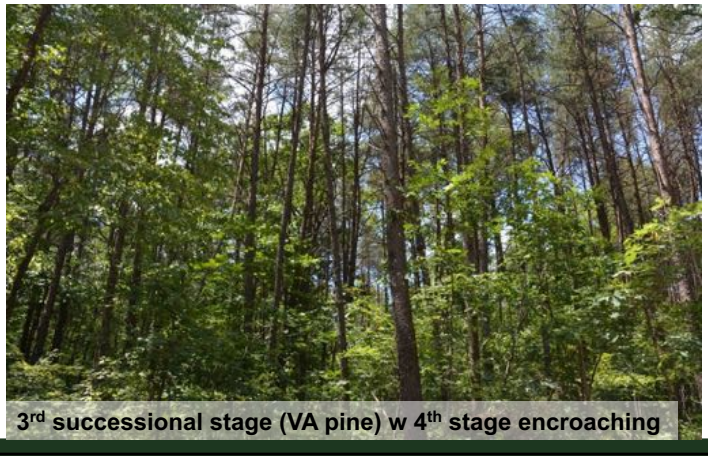

3rd successional stage (VA pine) w 4th stage encroaching

# Succession

Orderly progression of change in plant community composition

Various wildlife species require specific stages of succession

Succession is managed through disturbance (set-back) or planting (accelerate)

4th successional stage (2nd forest) – oak-hickory forest

# Succession

Orderly progression of change in plant community composition

Various wildlife species require specific stages of succession

Succession is managed through disturbance (set-back) or planting (accelerate)

4th successional stage

# Structure is a critical consideration when managing habitat

Don't confuse structure with successional stage

Structure can vary dramatically within any stage

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crabgrass and poor-joe

horseweed

# Edge, juxtaposition (arrangement), and interspersion

Edge **–** where vegetation types **(**not **“**habitats**”)** meet

Ecotone **–** transitional zone**;** characteristics of 2 vegetation types

Juxtaposition **–** proximity and arrangement of vegetation types

Interspersion **–** frequency of different vegetation types

High interspersion **=** lots of edge

Close proximity favors species with small home ranges

**- depending on vegetation type, structure, and arrangement**

Edge is not necessarily good…and can indicate problems if animals are typically found around edges

# Is edge important?

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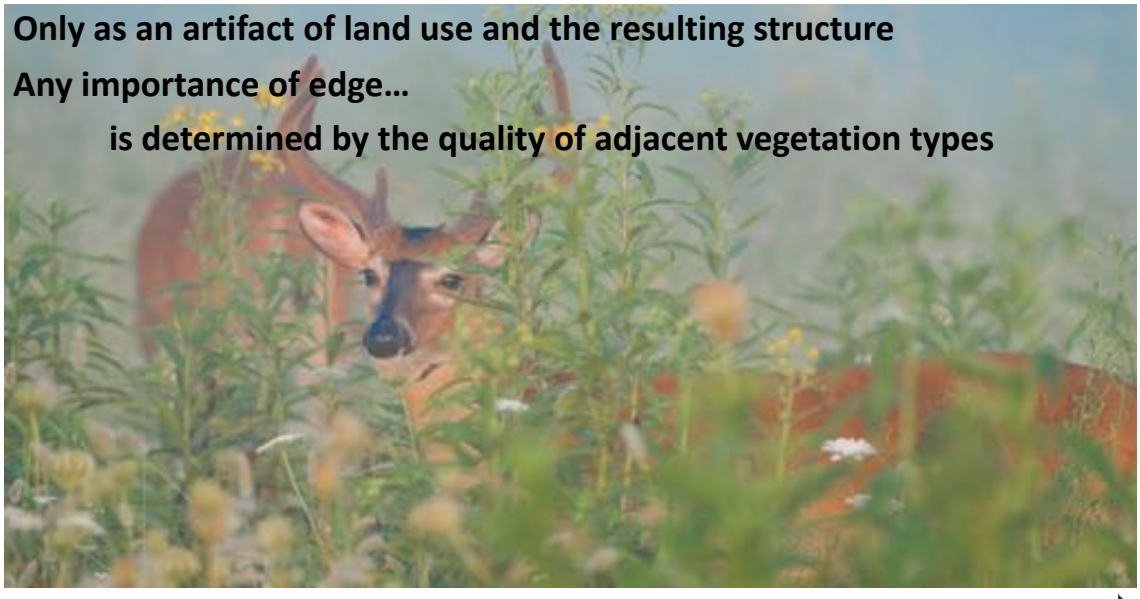

# Managing forests for wildlife: *What to do?*

Develop a forest mgmt plan
- **with a forester and a biologist**
- **identify specific objectives**

Regenerate the stand
- **even-aged management**
- **2-aged management**
- **uneven-aged management**

Improve the stand
- **thinnings / retention cuts**
- **prescribed fire / herbicides**

Nothing

# Hardwood regeneration considerations

**Clearcut method**
- **increased browse yrs 1 – 6 (avg 800 lbs/ac)**
- **increased soft mast yrs 1 – 5**
- **absence of hard mast**
- **high stem density yrs 3 – 20**

Effects ephemeral
- **must move mgmt around**




# Hardwood regeneration considerations

**Shelterwood method**

Effect varies with retention level

Effect similar to clearcut

- **with approx ≤30 sq ft/ac retained**

Effect less than clearcut

- **with approx 50 sq ft/ac**

Effect lengthened w final harvest

- **normally at year 6 – 8**

Effects ephemeral

- **must move mgmt around**

Year 2

Year 8

# Hardwood regeneration considerations

**Shelterwood w reserves**

- **BA reduced to 20 – 40 sq ft/ac**
- **increased browse yrs 1 – 6**
- **increased soft mast yrs 1 – 5**
- **retain mast trees**
- **high stem density yrs 3 – 20**

Effects ephemeral

- **must move mgmt around**

***OR***, can be maintained

- **low-intensity fire**
- **frequency by objective**
- **becomes a woodland**

Year 2

Year 8 w reserves

low-intensity backing fire

Following fire…

# Hardwood regeneration considerations

**Group selection**

Creates diverse stand structure

Patches of young forest structure

**- 0.1 – 2.0 ac (size influences composition)**

**(yrs between cuts/rotation age=% to harvest)**

Increased browse year 1 – 5

Increased soft mast year 1 – 5

May thin between groups

**- to help meet volume**

**- connect other harvest units**

# Forest Stand Improvement (FSI)

Improvement Cut for Wildlife

**Cut-and-fell**

**Girdle-and-spray**

**Hack-and-squirt**

**Reduce canopy cover >20%**

**Release favored crowns**

**Stimulate understory**

**50% Garlon 3A, 40% water, 10% Arsenal AC**

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# Doesn't fire kill hardwoods?

Fire may damage hardwoods

Fire may damage pines also

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***Low intensity is key*!**

Move large debris from around trunk

## Doesn't fire kill hardwoods?

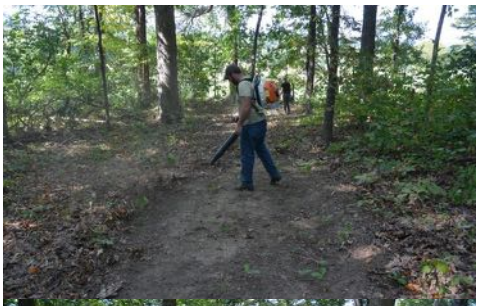
Fire may damage hardwoods

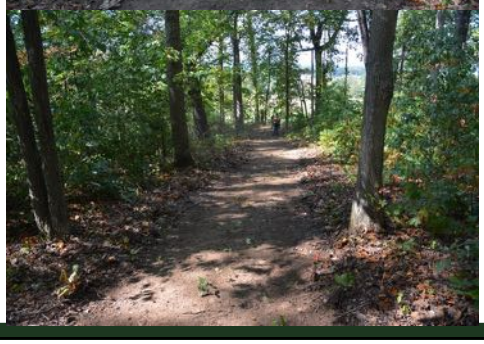
Fire may damage pines also

***Low intensity is key*!**

Move large debris from around trunk

# So how do you burn hardwoods?





**Correctly!**

With low-intensity fire
- **unless you *want* to kill trees**
  **(and that can be good according to objective)**

With experienced help

With an adequate firebreak

Only under ***correct*** conditions!

After obtaining burning permit

Follow your management plan

# So how do you burn hardwoods?

**Correctly!**

With low-intensity fire
- **unless you *want* to kill trees**
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Follow your management plan

# Oak/pine woodlands/savannas

Woodland
- **canopy closure 30 – 80%**
- **understory dominated by herbaceous species**

Savanna
- **canopy closure 5 – 30%**
- **understory dominated by herbaceous species**

Maintained with fire
- **1 – 4-yr return interval**

# Oak woodland restoration

Mature mixed hardwood-pine stand
- **Southern Pine Beetle outbreak 2003**
- **additional trees killed/felled 2005 – 16**
- **prescribed fire 1 – 3-yr return interval**
- **April and September fires**

**April 2006**

# Oak woodland restoration

Mature mixed hardwood-pine stand

- **Southern Pine Beetle outbreak 2003**
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**Sept 2008**

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Mature mixed hardwood-pine stand

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**July 2012**
**1,400 lbs (dry wt) selected deer forage / ac**

# Oak woodland restoration

Mature mixed hardwood-pine stand

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**June 2014**

# Oak woodland restoration

Mature mixed hardwood-pine stand

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**June 2017**

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**July 2018**

# Oak woodland restoration

**Open oak woodlands**

- **can provide outstanding forage**
- **similar to warm-season food plots**
- **frequent fire is necessary**
- **provide exceptional groundcover for nesting and brood rearing**
- **provide habitat components for a host of wildlife species**

**July 2018**

# Dealing with invasive species

**Don't be afraid of them!**

- you can kill them all!
- effort / persistence
- ATTITUDE!
- herbicide applications
- prescribed fire

spot-treatment for invasive shrubs

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burned March 2016

broadcast spraying japangrass—July 2017

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Oriental bittersweet—July 2015

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May 2016—native groundcover

# Dealing with invasive species

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- ATTITUDE!
- herbicide applications
- prescribed fire

August 2016—native groundcover

# Managing pine stands for wildlife

Thinning and herbicide applications

Precommercial thinning

- **thin to <200 trees / acre**

Commercial thinning (12 – 20 yrs)

- **thin to ~ 70 sq ft / ac (<100 trees)**

Kill undesirable hardwood stems

- **imazapyr (Arsenal / Chopper)**

# Managing pine stands for wildlife

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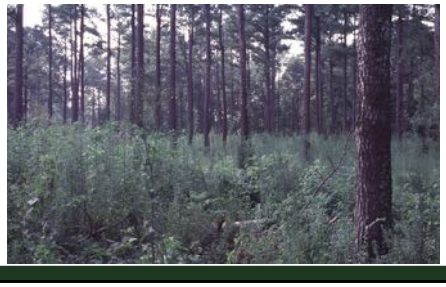
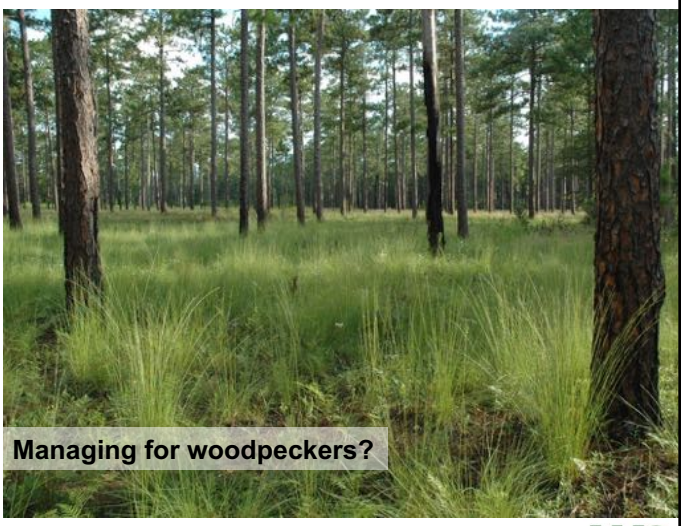
What level to thin to?

When and how often to burn?

How large of an area to burn?

- **which species are you managing for?**
- **season and frequency of fire influence habitat quality**
- **occupancy ≠ abundance**





**Managing for woodpeckers?**

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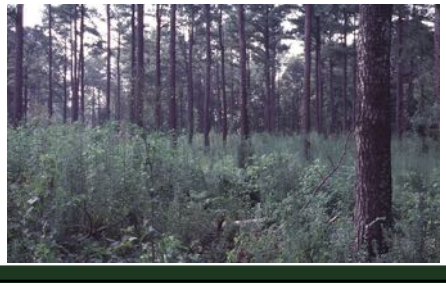

**Quail and turkeys need forbs and shrub cover**

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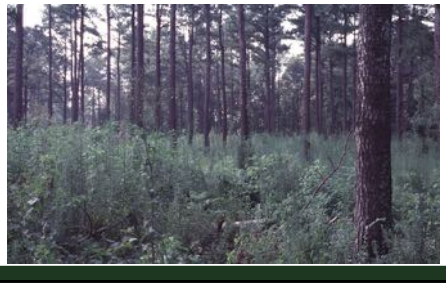

**Deer need hiding cover**

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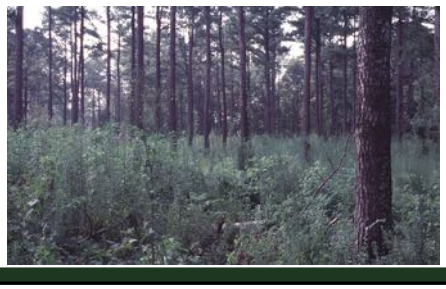

**All stands do not necessarily need managing same way**

# Diversify your management

**Repetitive spring burning promotes grass**
**- burned Apr 2012, 2014, 2016, 2018**

**Late summer burning promotes more forbs**
**- burned Sept 2011, 2013, 2015, 2017**

# Fields managed for wildlife…

3 factors determine quality of fields for wildlife

- **composition and structure of the plants**
- **field management**
- **surrounding landscape**

**nonnative grass—short structure from mowing**

**broomsedge—medium structure**

**big bluestem/switchgrass—tall structure**

# Fields managed for wildlife…

3 factors determine quality of fields for wildlife

- **composition and structure of the plants**
- **field management**
- **surrounding landscape**

native forbs—short structure

mixed native forb/grass—medium structure

native forbs—tall structure

# Fields managed for wildlife…

Structure is a critical consideration

Canopy cover ("umbrella cover")

- **provides overhead protection**

# Fields managed for wildlife…

Structure is a critical consideration

Canopy cover ("umbrella cover")
- **provides overhead protection**

Open structure at ground level
- **allows movement by small wildlife**
- **allows foraging**
- **allows seedbank to germinate**
- **increases food plants**
- **makes more food available**

# Fields managed for wildlife…

Structure is a critical consideration

**Structure at ground level is closed with dense grass**

# Planting nwsg and forbs is not necessary

**Kill nonnative grass cover and manage seedbank response**


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# Planting nwsg and forbs is not necessary

**Kill nonnative grass cover and manage seedbank response**

# Planting nwsg and forbs is not necessary

**Planted grass provides NO food and poor cover for most wildlife species**

big bluestem and indiangrass

big bluestem and indiangrass

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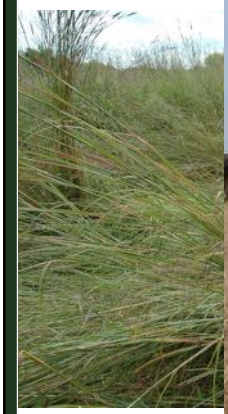

switchgrass

# Planting nwsg and forbs is not necessary

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**This is much more PRODUCTIVE and CHEAPER!**

# Planting nwsg and forbs is not necessary

**Reduce grass density by disking or herbicide application**

**Heavy offset disking OR 2 qts glyphosate or 48 oz Arsenal / ac**

# Managing early succession

**Use selective herbicides**

- **kill undesirable plants**
- **promote desirable plants**

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**Prescribed fire**

- 2 – 7-year return interval
- alternate seasons

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**Disking**

- in blocks on rotation
- prior to spring green-up
- 1 – 4-year return interval

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**Prescribed fire**

- **2 – 7-year return interval**
- **alternate seasons**

**Disking**

- **in blocks on rotation**
- **prior to spring green-up**
- **1 – 4-year return interval**

**AVOID MOWING if possible**

# Why should you consider food plots?

Be honest!

- **increase available nutrition?**
- **to help you see or shoot animals?**

What is the "need"?

- **are weights down?**
- **numbers low?**
- **is food limiting? If so, when and why?**
- **are your observations of animals down?**

Answers to these questions will help guide your management

# Food plots can increase food availability

High-quality forage food plots
**2,000 – 10,000 lbs/ac/yr**
Thinned and burned stand
**500 – 1,400 lbs/ac/yr**
Thinned stand (initially)
**500 – 800 lbs/ac/yr**
Burned stand
**150 – 500 lbs/ac/yr**
Unmanaged stand
**25 – 100 lbs/ac/yr**
Early succession
**600 – 4,000 lbs/ac/yr**

*Conservatively…*

**1 ac food plot =**

**2 ac thinned/burned stand**

**3 ac thinned stand**

**4 ac burned stand**

**>20 ac unmanaged forest**

# What should you plant?

What are you trying to do?
- **increase NCC? Kill lots of deer? Shoot doves? Feed sparrows?**

Consider availability, timing, and attraction
- **warm-season**
- **cool-season**

Stress periods
- **lactation period?**
- **late summer?**
- **late winter?**

Single species **/** mixtures
- **options galore**

# Warm-season food plots

Plant April – June

Provide forage through summer

- **lactation**
- **fawn growth**
- **antler development**
- **late summer stress period**

Provide seed and grain through winter for…

**white-tailed deer, rabbits, squirrels, raccoon, wild turkey, mourning dove, bobwhite, sparrows, junco, cardinal, goldfinch, blue jay, flicker, red-bellied woodpecker**

"Bird feeder in a field"

# Cool-season food plots

Excellent source of protein and digestible energy

Includes both annuals and perennials

Plant Feb – Apr; Aug – Oct

Provide nutrients for:

- **reproductive demands**
- **antler development**
- **lactation**
- **winter stress period**

Important for:

**white-tailed deer, black bear, rabbits, groundhog, wild turkey, ruffed grouse, sparrows, junco, cardinal, bluebird, indigo bunting, goldfinch**

## Tips for food plots…

- Test and amend soils accordingly
- Calibrate equipment
- Prepare seedbed and plant correctly
- Plant according to need, not popularity
- Consider weed control
- Install exclusion cages
- Manage your woods roads
- Separate acreage for warm-/cool-season plots

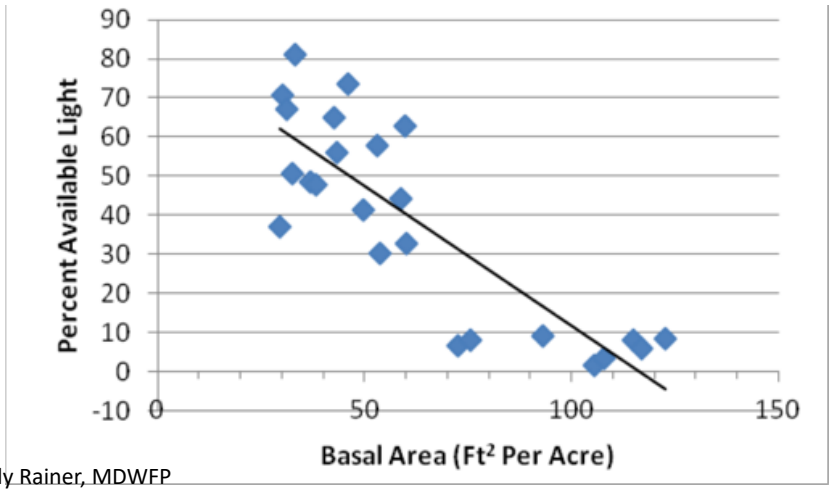
## Time to take a break!

WOODLAND STEWARDS
A Regional Extension Program for Landowners

## Let's look at some examples!

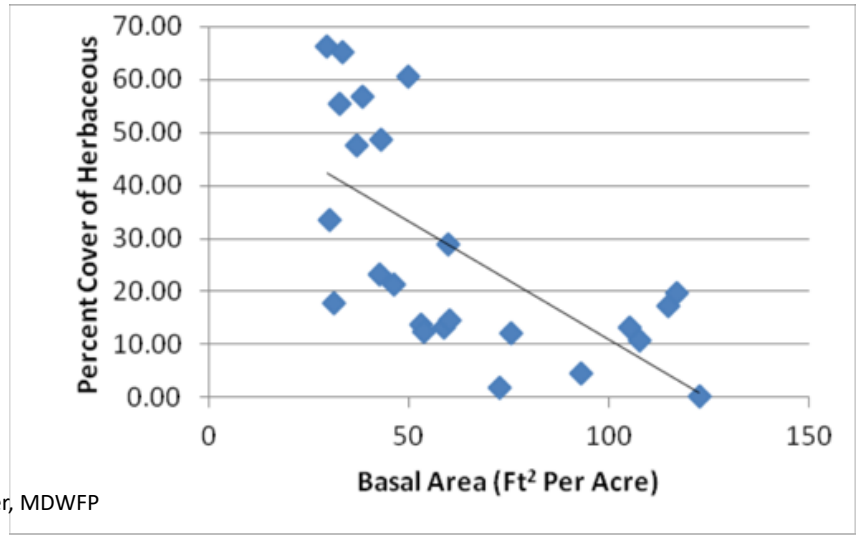
How do we create quality deer habitat?

## As Canopy Coverage ↑ Sunlight ↓




Credit – Cody Rainer, MDWFP

## As Canopy Coverage ↑ Herbaceous Plants ↓

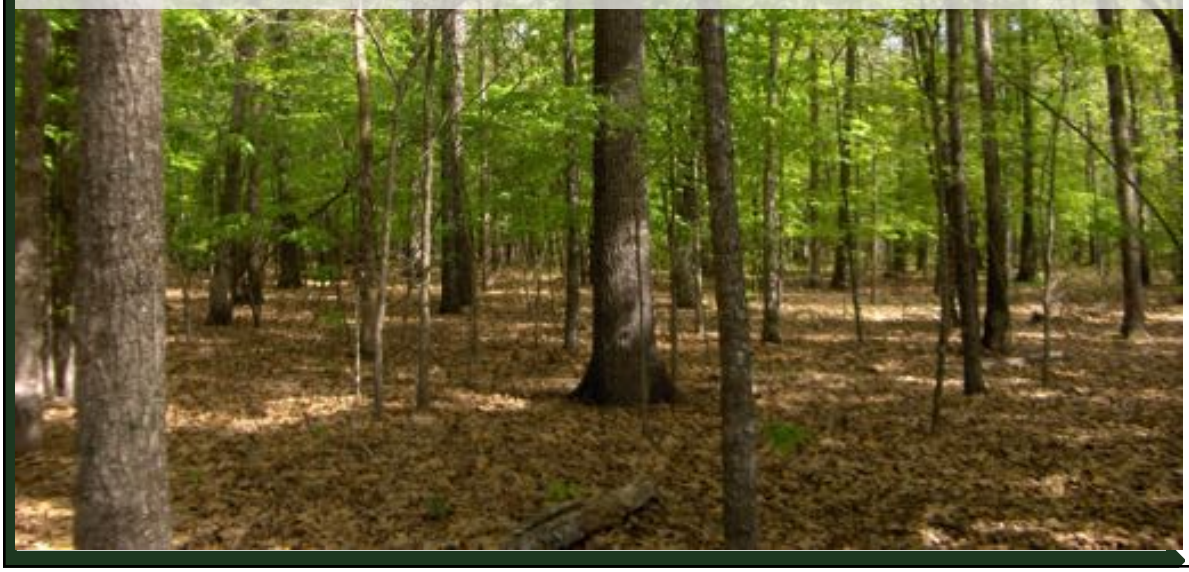



Credit – Cody Rainer, MDWFP

## Good Pine Tree Habitat

**Poor Deer Habitat**

## What can a Deer eat?



## Good Deer Habitat

## Good Deer Habitat

## Good Deer Habitat


Too much Mid-story!


Imazapyr Herbicide
August – October Application

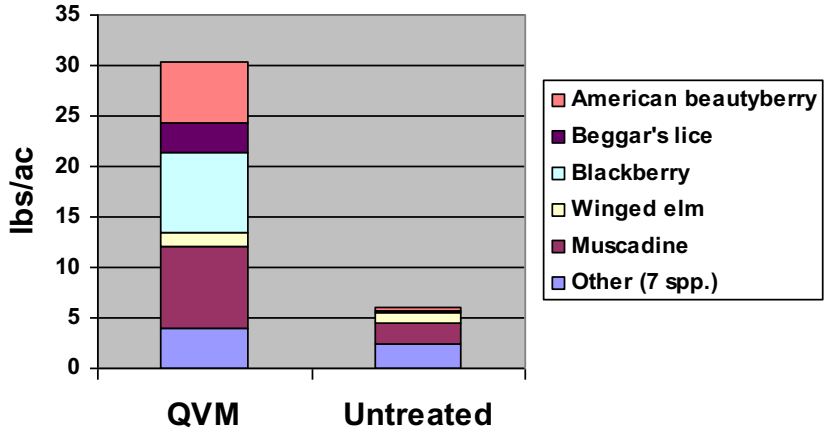
## Prescribed Fire
## January – March Application

## 1st growing season

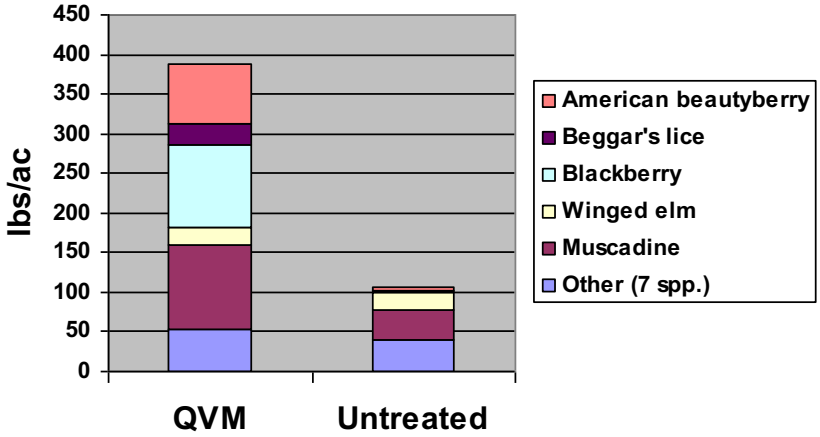
## 2nd growing season

## 4th growing season

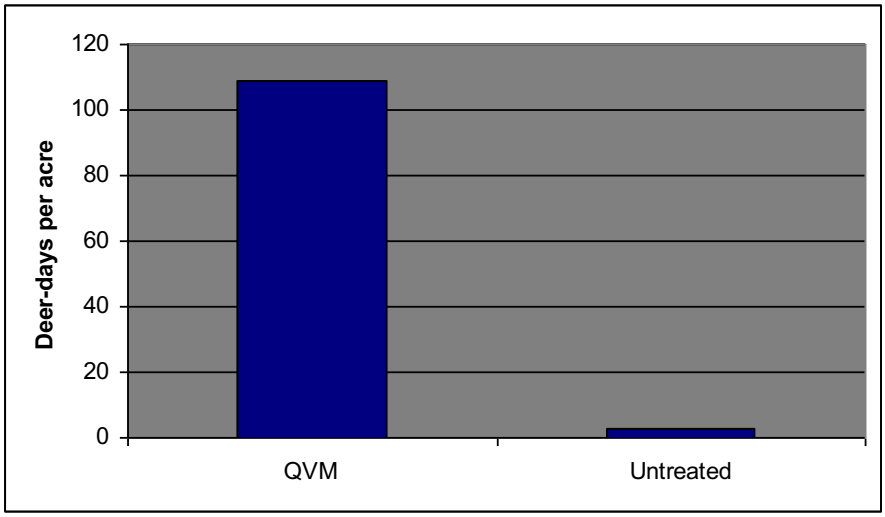
**Forest management (QVM) increased digestible protein production of 12 preferred deer forages by nearly 500% during years 2 and 3 post-treatment.**



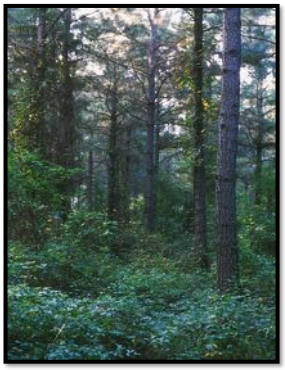

**Forest management (QVM) increased leaf biomass production of 12 preferred deer forages by 350% during years 2 and 3 post-treatment.**



## Forest management (QVM) increased deer nutritional carrying capacity




Control



Fire and Herbicide

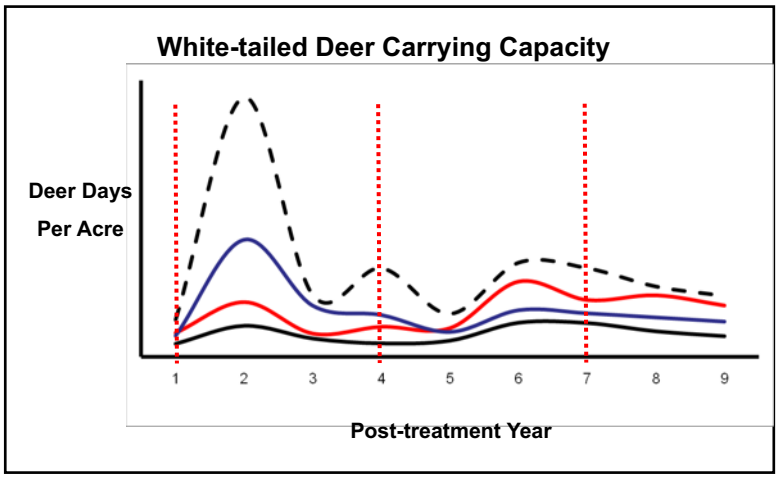
Herbicide only

Fire only

MISSISSIPPI STATE

Weyerhaeuser

# Deer Forage Response




Research from Dr. Ray Iglay

Weyerhaeuser

MISSISSIPPI STATE

WOODLAND STEWARDS

# Deer Forage Requirements

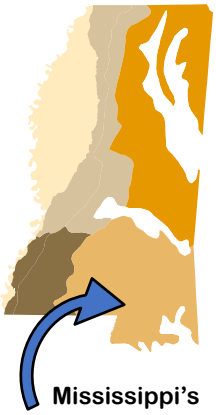
## Question:

1. How much does an adult deer eat each day?

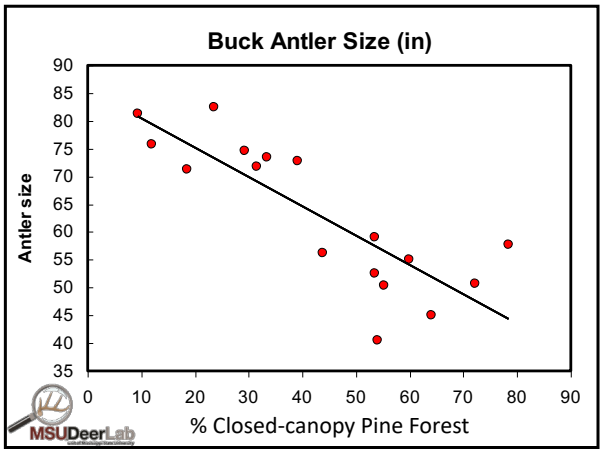
   About 3 pounds (6 including water weight)

2. In a typical pine forest how much deer forage is produced per acre?
   a) In an unmanaged pine plantation? About 100 pounds
   b) In a managed pine plantation? About 400-800 pounds

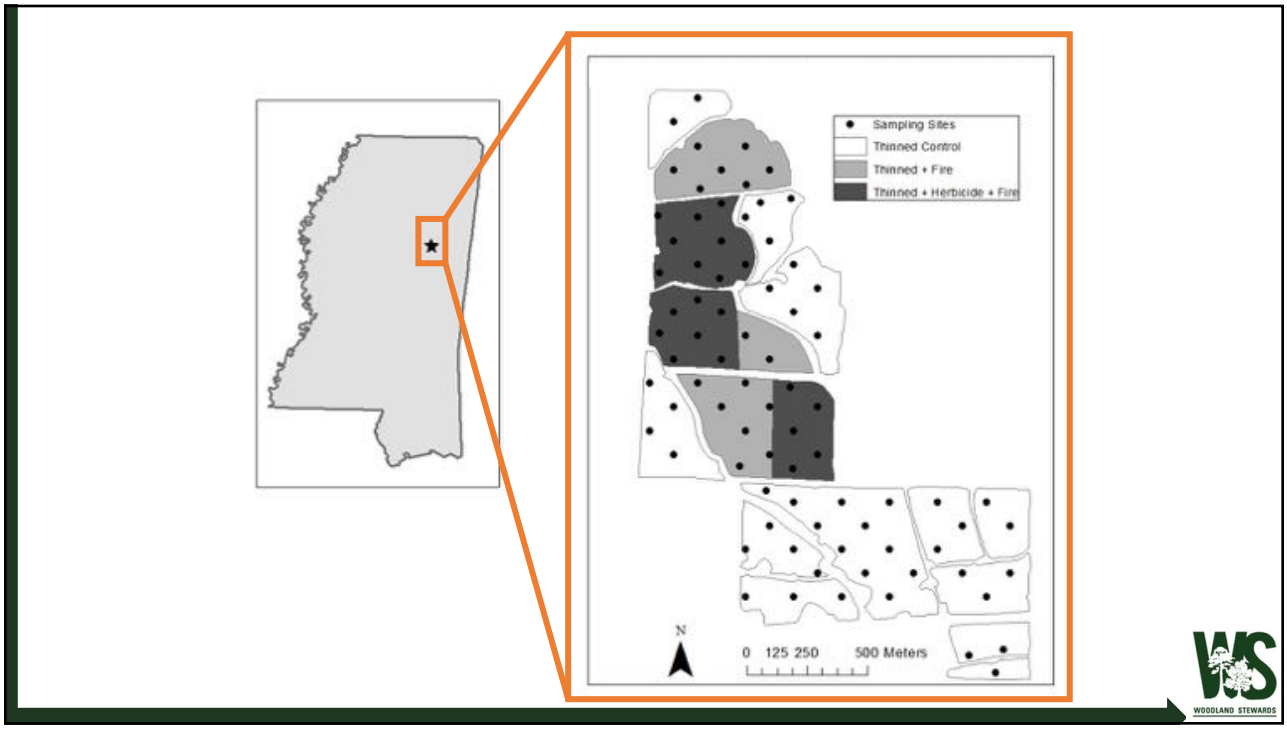
WOODLAND STEWARDS




# Forest Management Impacts Habitat & Deer




# Wildlife Habitat Preference Using Trail Cameras


Sampling Sites
Thinned Control
Thinned + Fire
Thinned + Herbicide + Fire
N
0 125 250 500 Meters

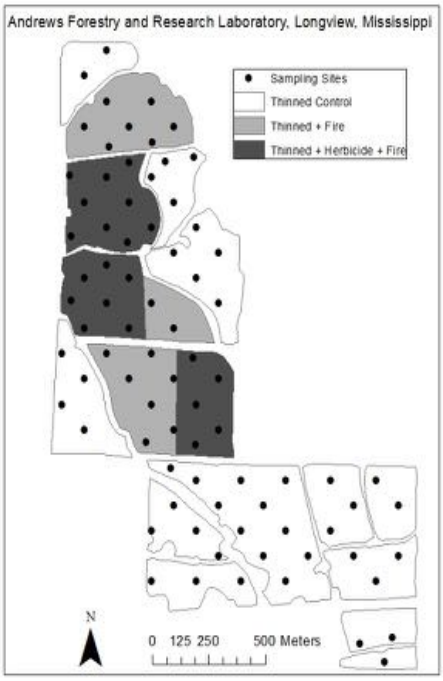

80+ Basal Area

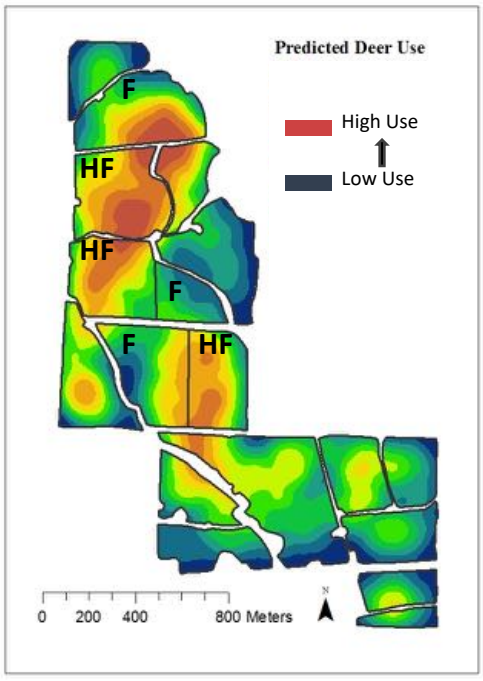
## 60 Basal Area

## 40 Basal Area


Imazapyr

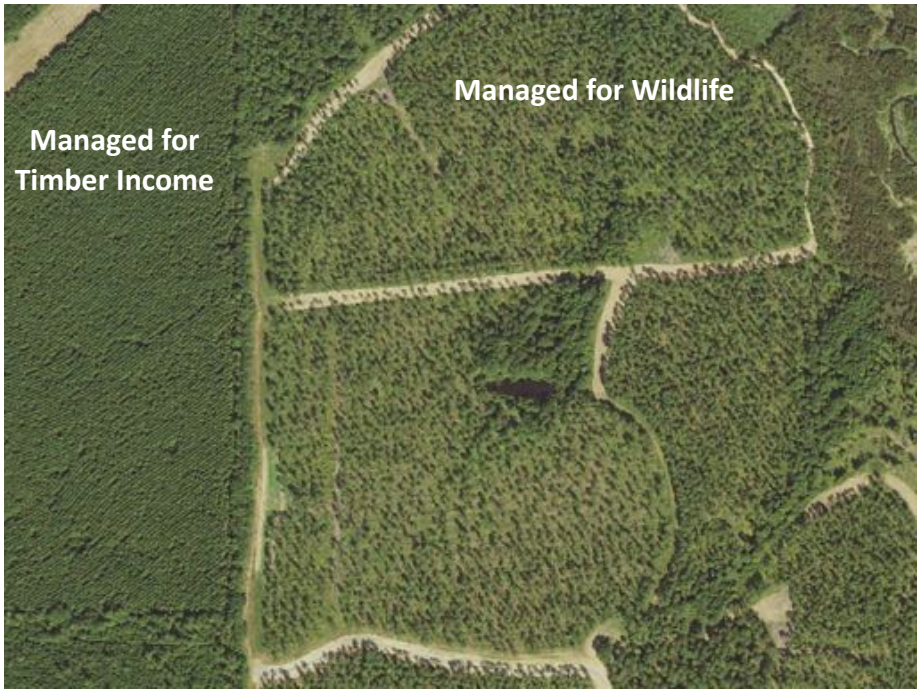

Sampling Sites
Thinned Control
Thinned + Fire
Thinned + Herbicide + Fire
N
0 125 250 500 Meters


Andrews Forestry and Research Laboratory, Longview, Mississippi
Sampling Sites
Thinned Control
Thinned + Fire
Thinned + Herbicide + Fire
N
0 125 250 500 Meters

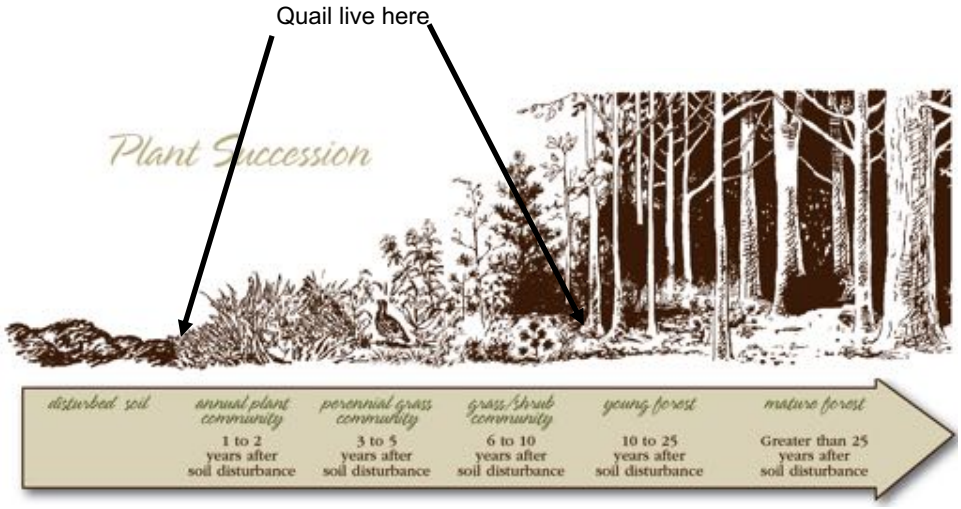

Predicted Deer Use
High Use
Low Use
F
HF
HF
F
F
HF
0 200 400 800 Meters
N

## How should I manage my forest?

**It depends on what you want!**



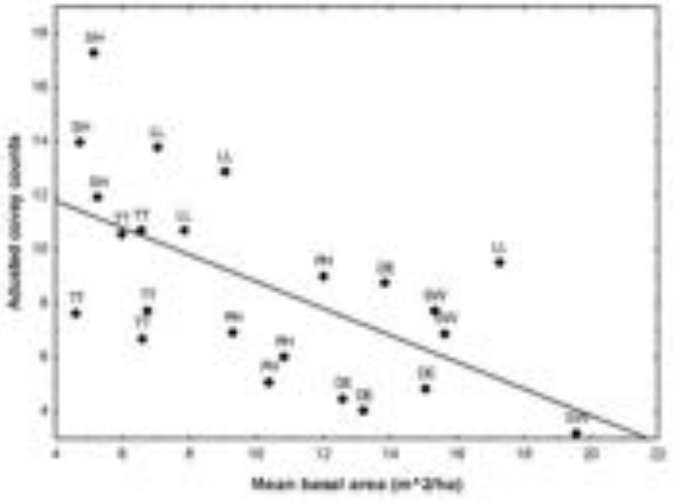
## How do we create quality bobwhite habitat?




## Let's look at some examples!

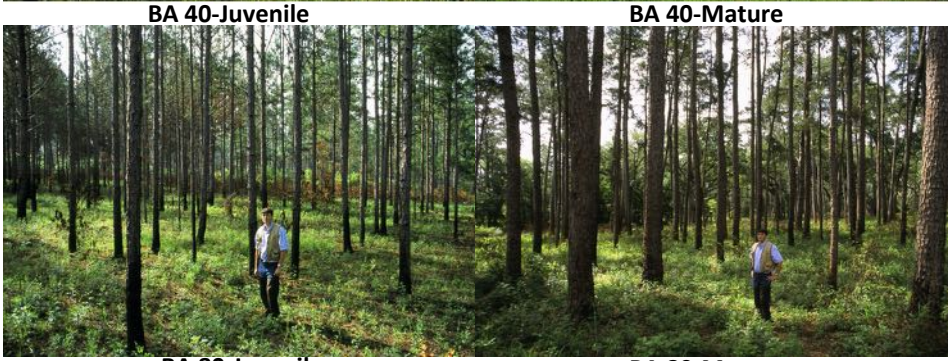
How do we create quality bobwhite habitat?

# Bobwhite need the sun too!




BA 40-Juvenile

BA 40-Mature



BA 80-Juvenile

BA 80-Mature

## Bobwhite like fire too!


## How do we create quality bobwhite habitat?

# Case Studies – Integrating Wildlife and Intensive Forest Management

Noxubee National Wildlife Refuge Quail Demonstration Area

**FALL 2007 – WINTER 2008**
- ❖ Thin timber to 50-60 $ft^2$/acre
- ❖ Commercial hardwood removal
- ❖ Leave select mast producing hardwoods

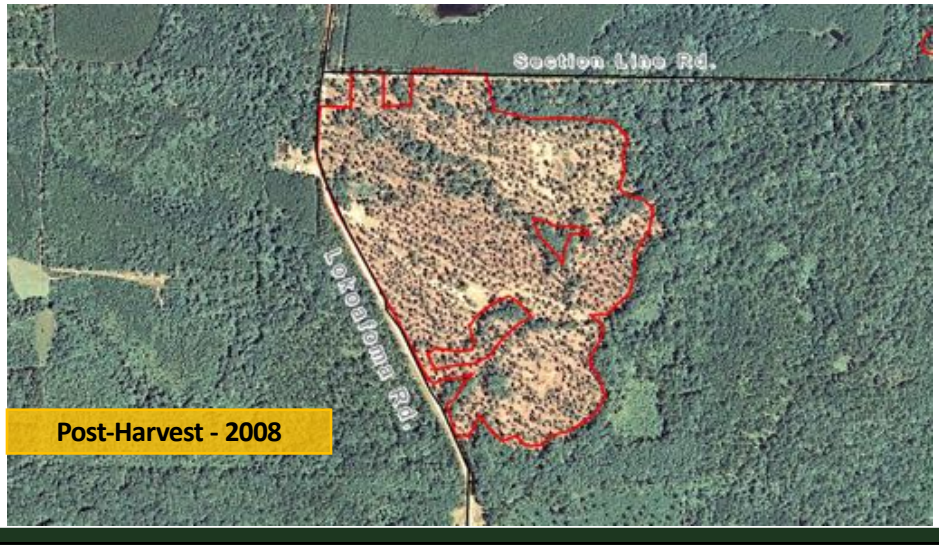
**EARLY FALL 2008**
- ❖ Selective herbicide – skidder applied
- ❖ 32 oz/acre of Chopper Gen II

**WINTER 2009**
- ❖ Prescribed burn

# Case Studies – Integrating Wildlife and Intensive Forest Management

Pretreatment - 2007

# Case Studies – Integrating Wildlife and Intensive Forest Management




Post-Harvest - 2008

# Case Studies – Integrating Wildlife and Intensive Forest Management

Post-Harvest - 2008

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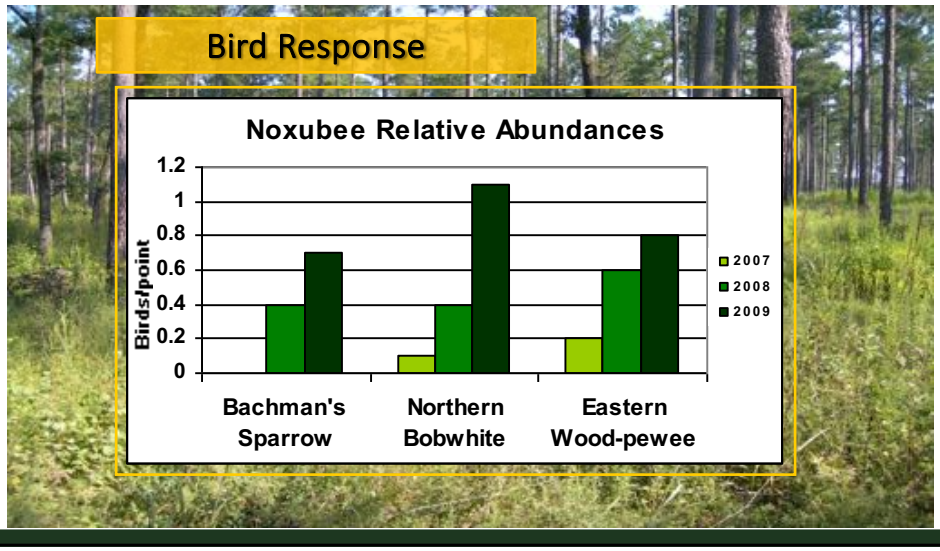
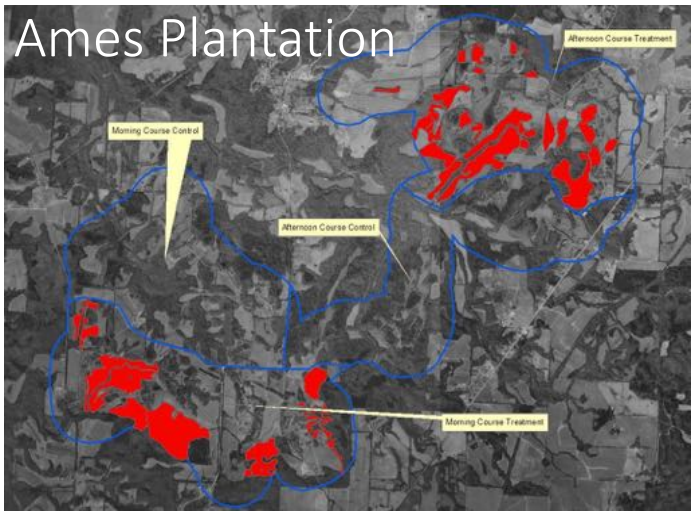


## Case Studies – Integrating Wildlife and Intensive Forest Management




## Case Studies – Integrating Wildlife and Intensive Forest Management

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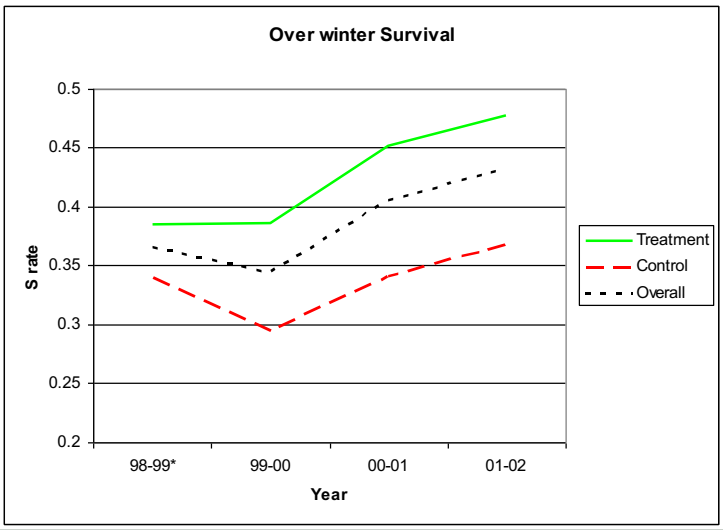
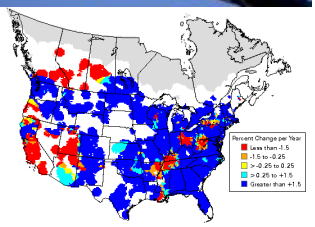
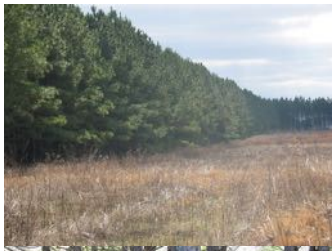



# Case Studies – Integrating Wildlife and Intensive Forest Management

- You can't manage this!



- You can manage this!



# What about non-game species?

*Proceedings of 2007 Louisiana Natural Resources Symposium*

Management of Bottomland Hardwood Forests for Birds

Daniel J. Twedt[1] and R. Randy Wilson[2]

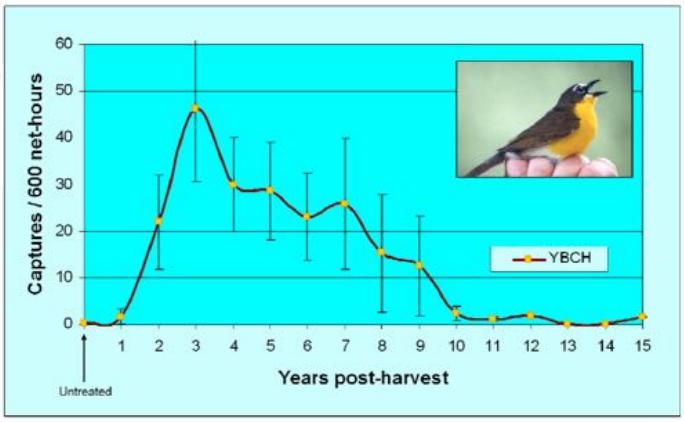



Figure 3. Captures of yellow-breasted chat (YBCH) using mist-nets within bottomland hardwood forests after application of wildlife-forestry silvicultural treatments and on untreated control stands (zero years post-harvest).

# What about non-game species?

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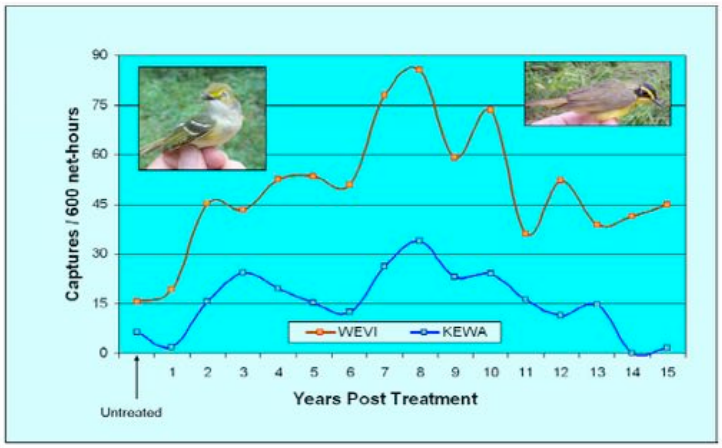


Figure 4. Captures of white-eyed vireo (WEVI) and Kentucky warbler (KEWA) using mist-nets within bottomland hardwood forests after application of wildlife-forestry silvicultural treatments and on untreated control stands (zero years post-harvest).

# What about non-game species?

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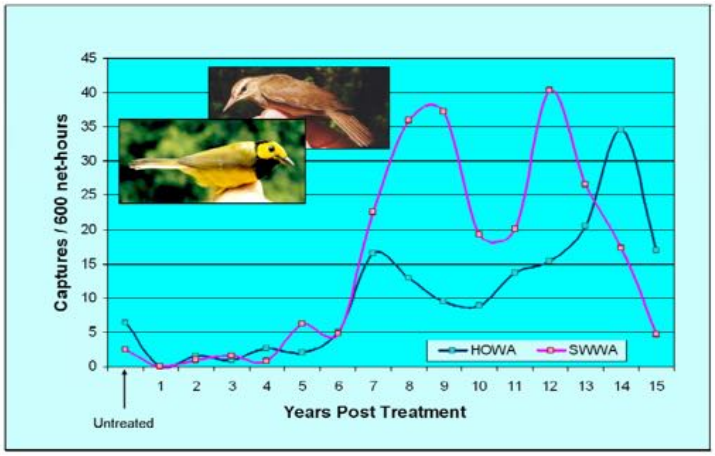



Figure 5. Captures of Swainson's warbler (SWWA) and hooded warbler (HOWA) using mist-nets within bottomland hardwood forests after application of wildlife-forestry silvicultural treatments and on untreated control stands (zero years post-harvest).

# Avoid Tunnel Vision!

- Oaks aren't the only good thing on your property...there's more!

# Wildlife Beneficial Trees – *"Beyond the Oaks"*

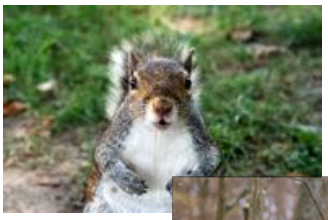
- Non-oak hardwoods
  - Sugarberry



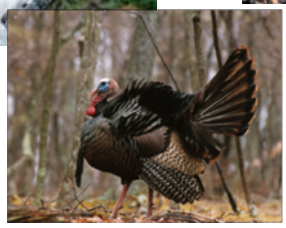



# Wildlife Beneficial Trees – *"Beyond the Oaks"*

- Non-oak hardwoods
  - Dogwoods






# Wildlife Beneficial Trees – *"Beyond the Oaks"*

- Non-oak hardwoods
  - Black Locust/ Honey Locust





# Wildlife Beneficial Trees – *"Beyond the Oaks"*

- Woody Shrubs, Vines, and Semi-woody Plants
  - Blackberry (*Rubus* spp.)
    - Most important group of plants in SE!
      - Deer, Cottontails, numerous songbirds, Small mammals
      - Escape/loafing cover



# Wildlife Beneficial Trees – *"Beyond the Oaks"*

- Woody Shrubs, Vines, and Semi-woody Plants
  - Greenbrier (*Smilax* spp.)
    - Ruffed Grouse, Wild Turkey, Northern Bobwhite
    - 40+ songbird
    - Preferred deer browse
    - Swamp, Marsh, and Cottontail Rabbits


# Wildlife Beneficial Trees – *"Beyond the Oaks"*

- Woody Shrubs, Vines, and Semi-woody Plants
  - Poison Ivy/Poison Oak
    - Good deer browse
    - Numerous songbirds
    - Northern Flicker, Yellow-bellied Sapsucker eat fruit
    - Swamp Rabbit


# Wildlife Beneficial Trees – *"Beyond the Oaks"*

- Woody Shrubs, Vines, and Semi-woody Plants
  - American beautyberry
    - 40+ species of songbirds
    - Medium browse preference for deer
      - Fruit heavily used in November
    - Norther bobwhite, racoon opossum and Armadillo consume fruit

# Questions?

**Please type your questions into the chat window**

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WOODLAND STEWARDS

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