

Bird Response to Bottomland Forest Restoration



USGS Patuxent Wildlife Research Center

Biennial Science Meeting

11-13 October 2006

Laurel, MD

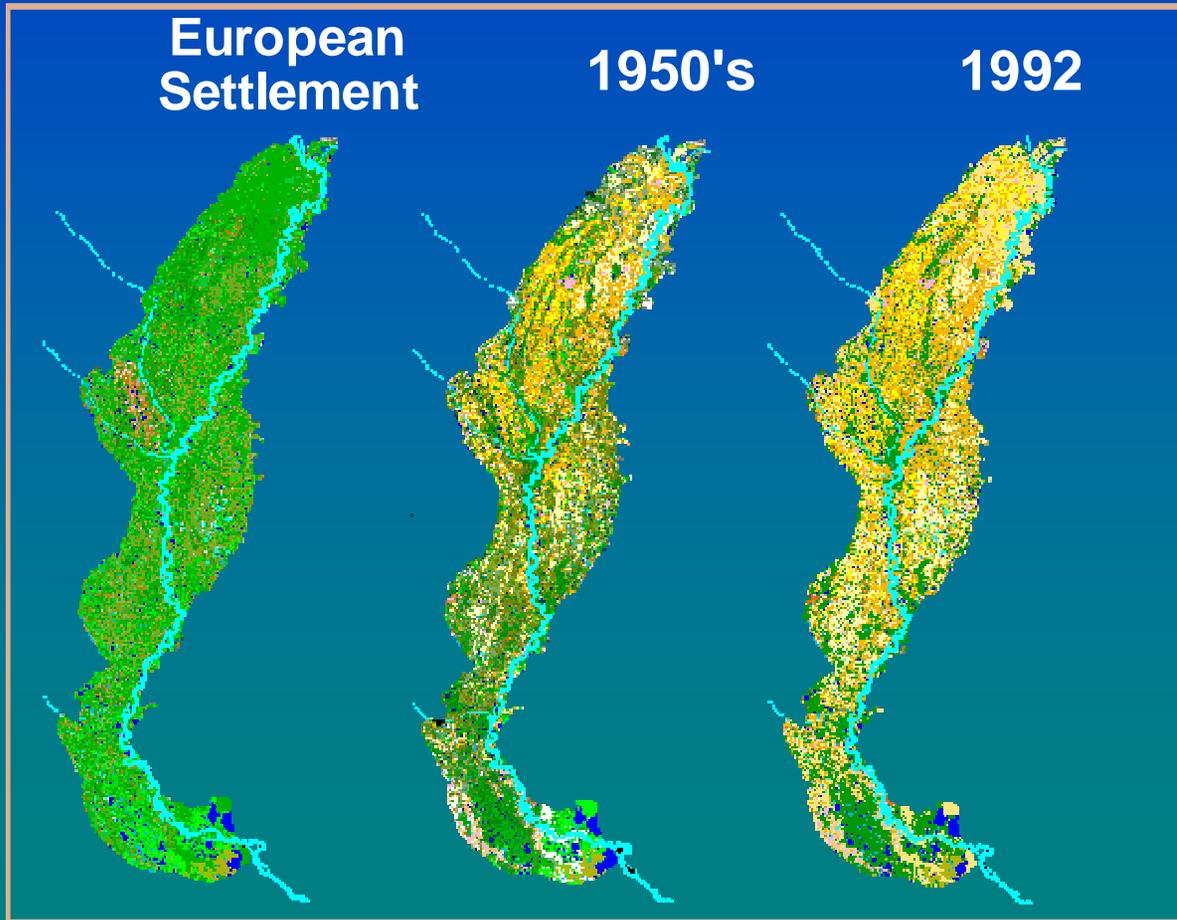


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Ecosystem Change Relative to Migratory Birds

Alterations To Vegetative Structure



75% Reduction in
Forested Area

Fragmentation of
Remaining 25% into
35,000+ Blocks

Nearly 100% Loss of
“High-site” BLHW’s

Avian Habitat

Landscape Quality



- **Block size and Configuration**
- **Distance from Hostile Habitats**

Site Quality

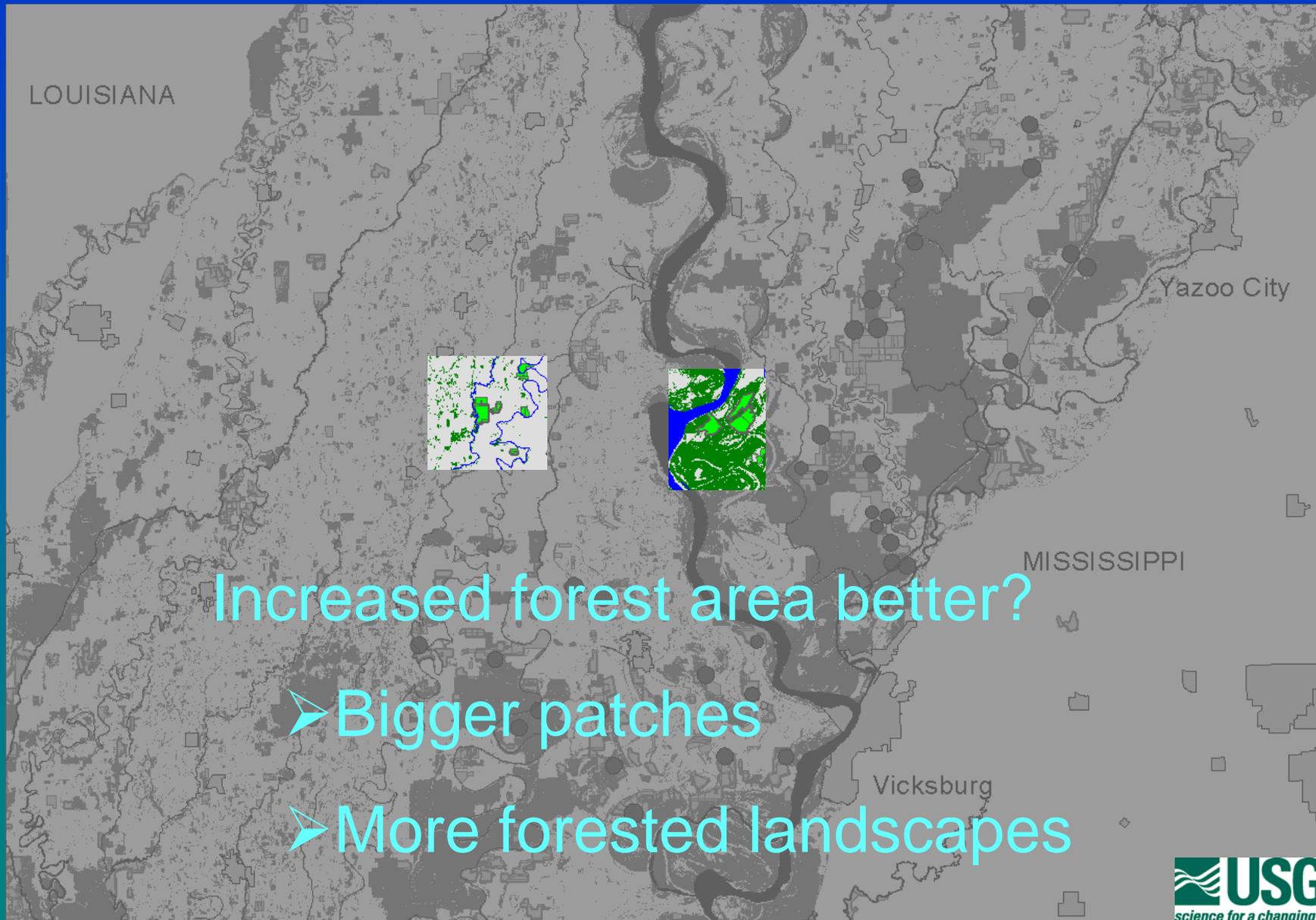


- **Forest Composition & Structure**
- **Landscape Position & Wetness**

Restoration for Forest Birds



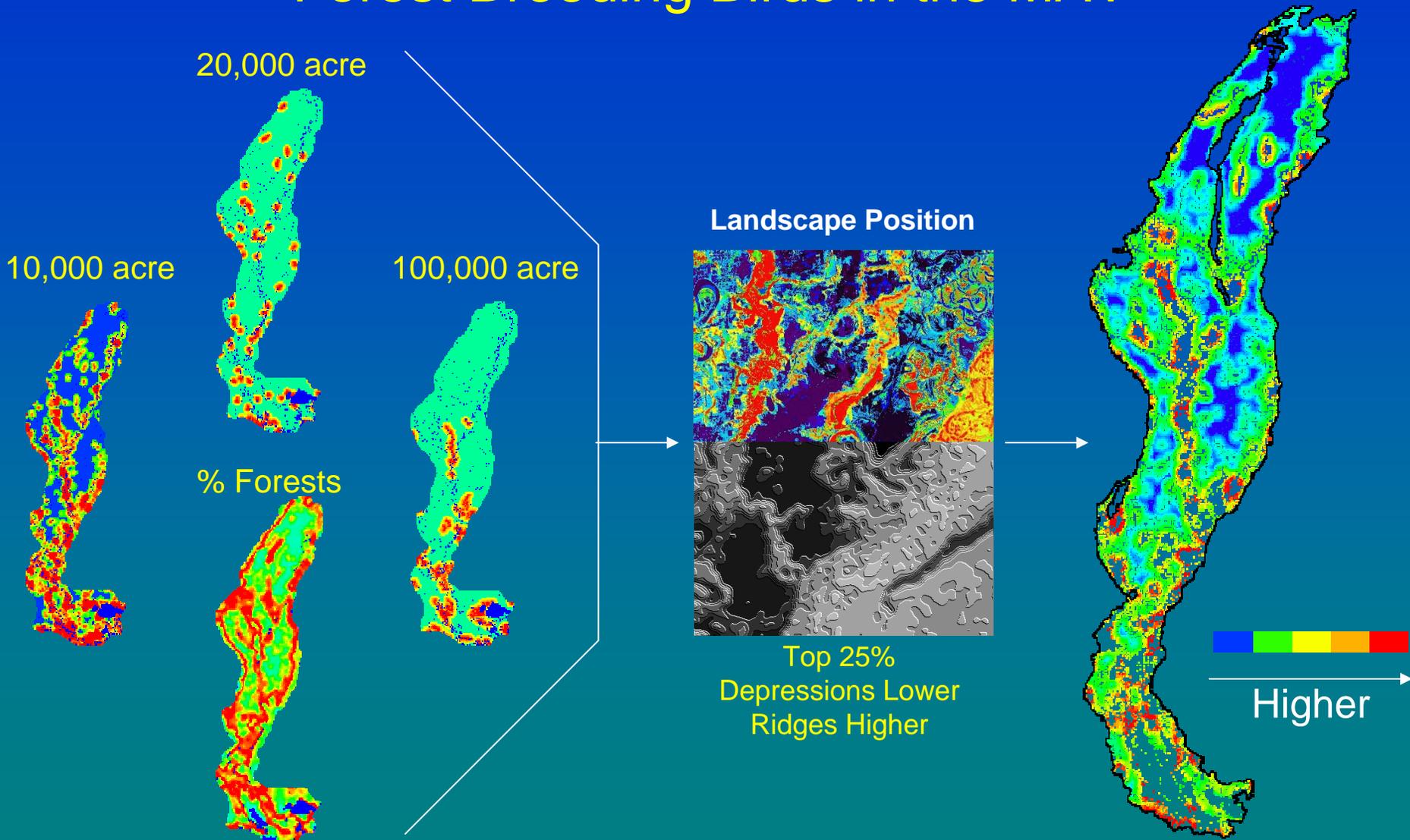
Landscape Assumptions



Increased forest area better?

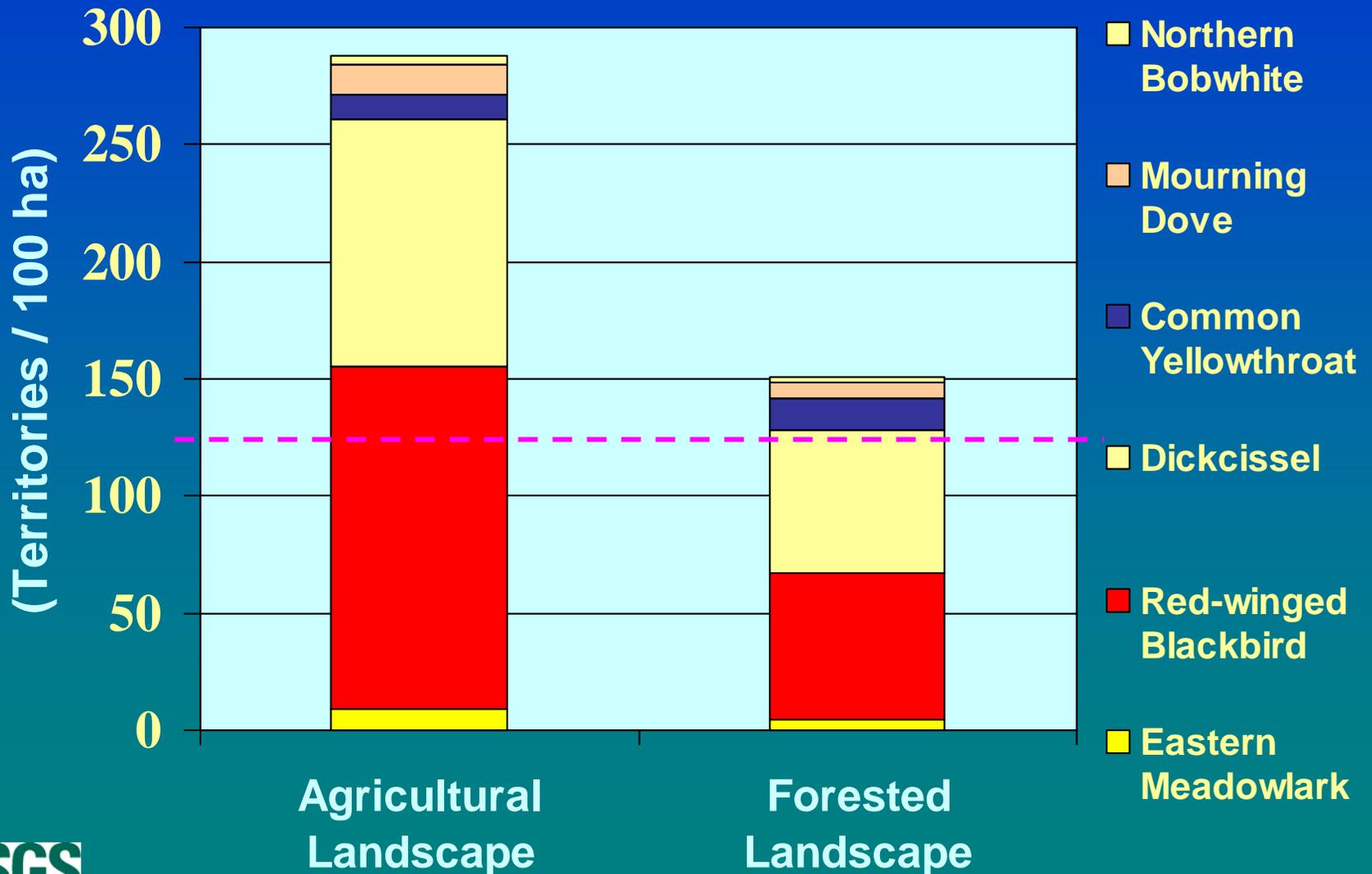
- Bigger patches
- More forested landscapes

Reforestation Decision Support Model for Forest Breeding Birds in the MAV



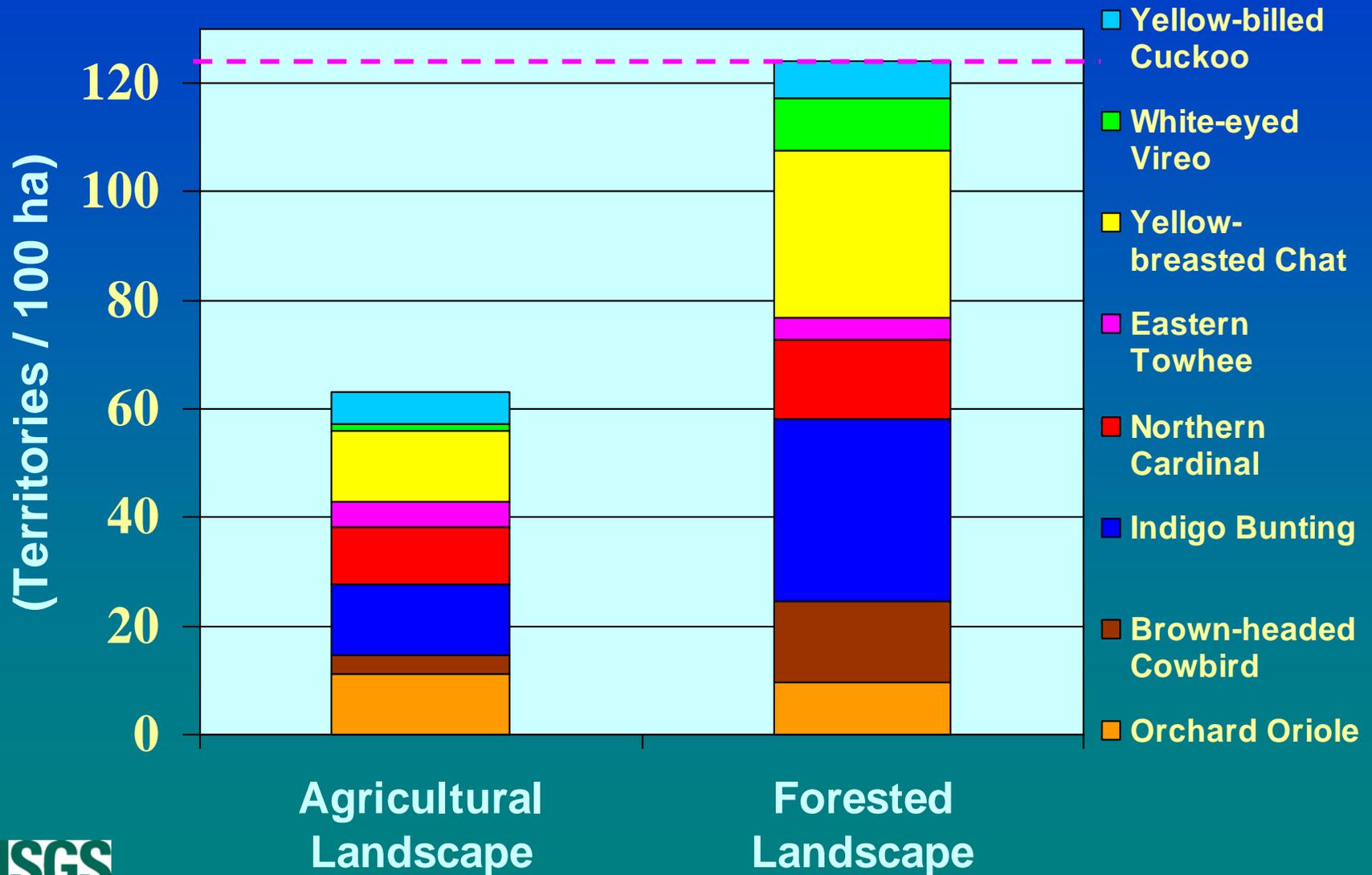
Relative Abundance

“Grassland Birds”



Relative Abundance

“Shrub - Forest Birds”

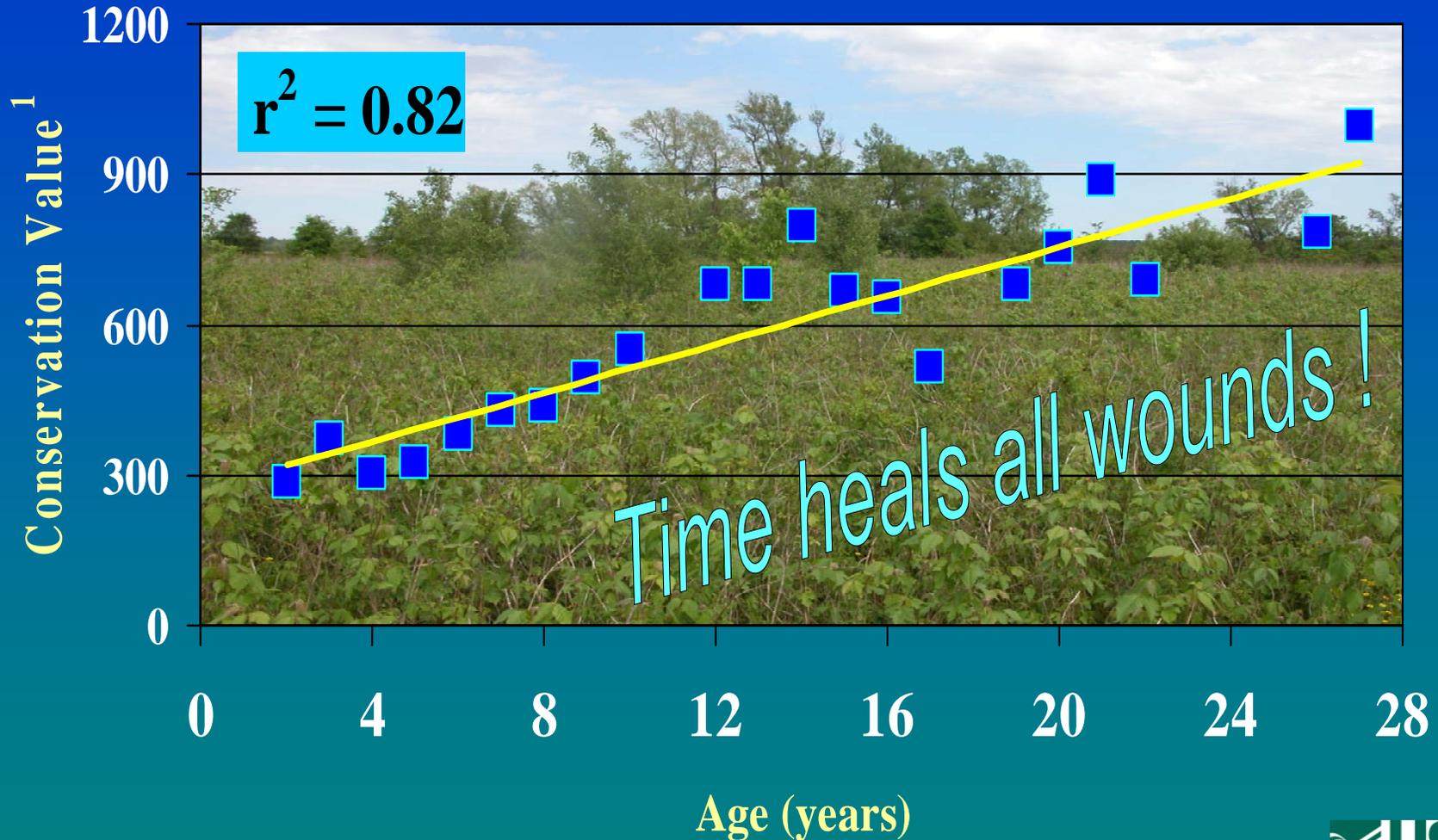


Site Assumptions

- Plant many species (~70 species available)
 - Insects, fruits, temporal.
- Plant pioneer fast-growing species
 - Colonization by forest birds, increase seed rain.
- High but heterogeneous stem densities
 - Dense (nurse trees, timber quality & emergent trees)
 - Gaps (foraging, juvenile cover, invading trees).
- “Drier” bottomland sites = greater ground cover

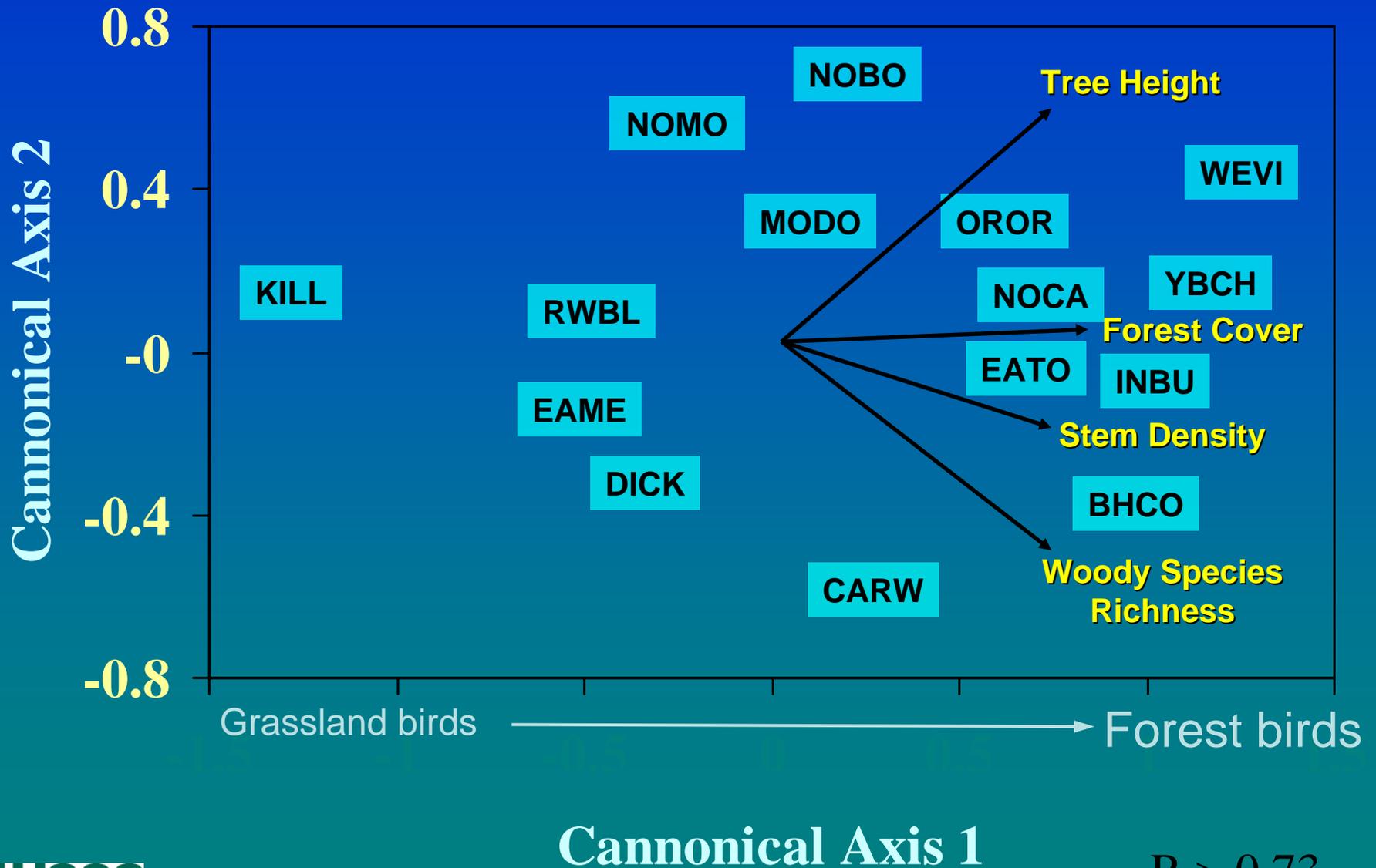
Time

~200 reforested sites <28 years old



¹ Twedt, D. J. 2005. An objective method to determine an area's relative value for avian conservation.

Bird – Vegetation Relationship

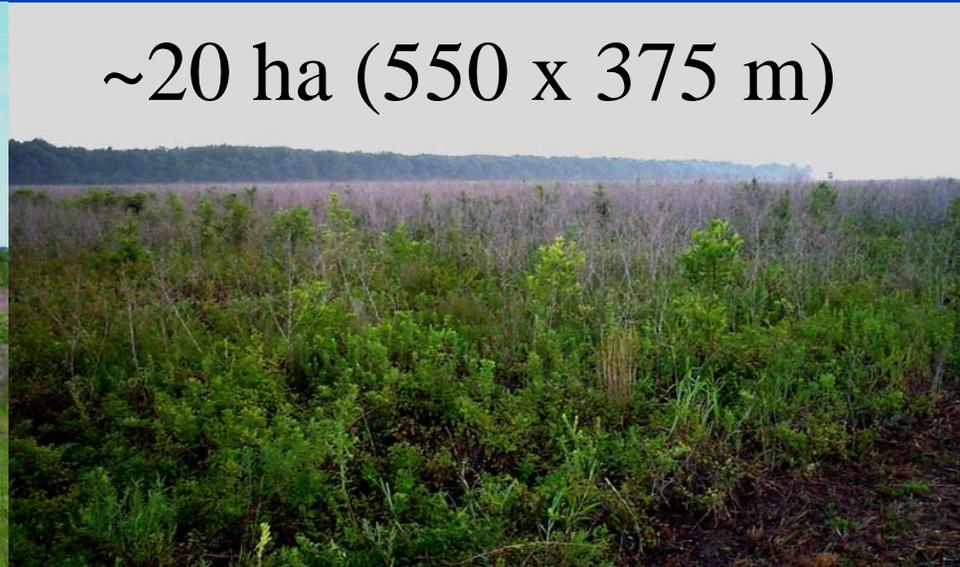
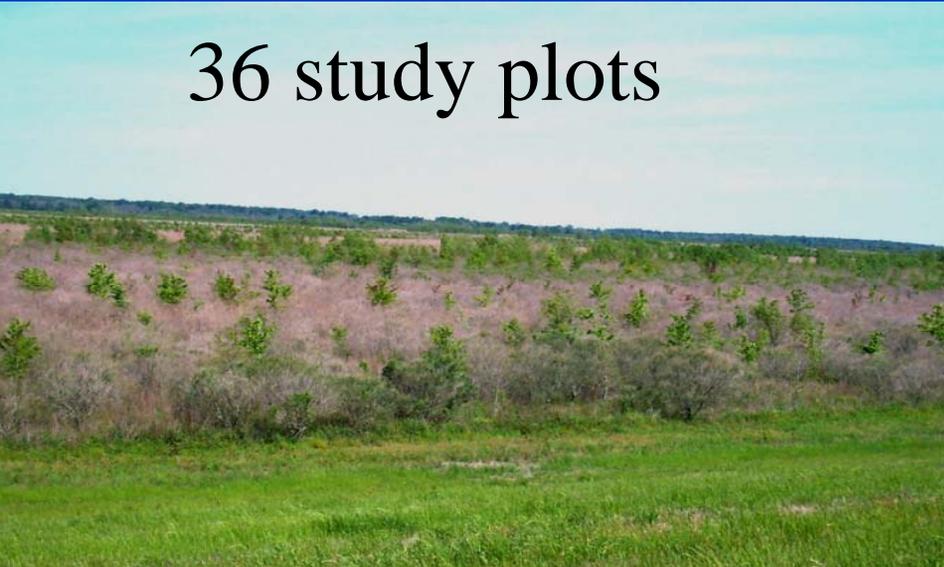


$R > 0.73$

Do initial restoration decisions affect productivity of birds?

36 study plots

~20 ha (550 x 375 m)



Models of Nest Survival

Habitat effects

- Tree cover (and latitude)
- Steepness
- Slope
- Vegetation

Edge effects

- Distance to forest (km)
- Distance to agriculture

Management

Effects

- % Forest (deciles)
- % Agriculture
- % Reforested



Best Models (AIC_c)

Species (9)

Effects

Orchard Oriole & Northern Mockingbird

Null

Mourning Dove & Yellow-billed Cuckoo

Landscape

Northern Cardinal, Dickcissel &
Yellow-breasted Chat

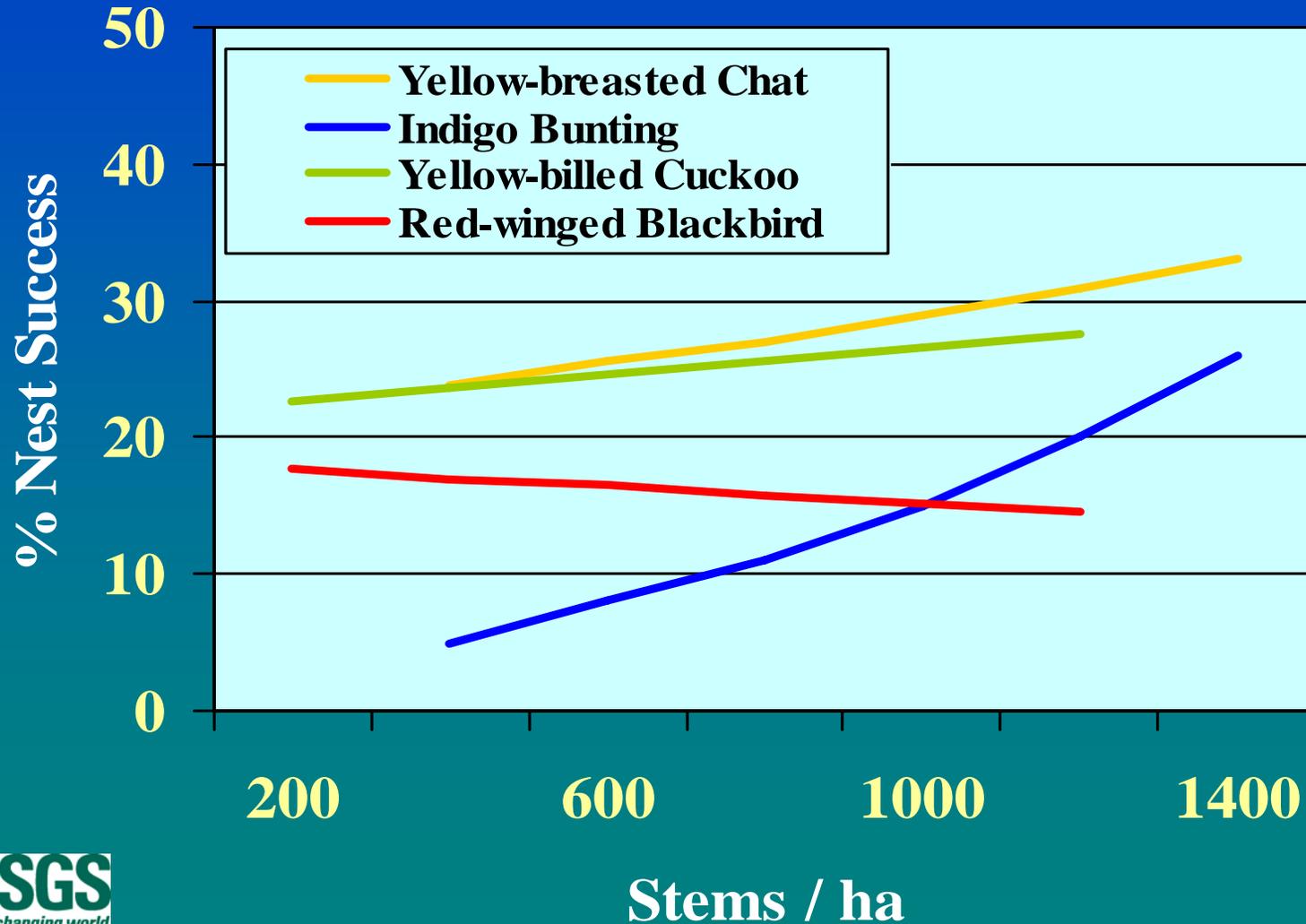
Edge

Indigo Bunting, Yellow-breasted Chat,
Dickcissel, Red-winged Blackbird,
Yellow-billed Cuckoo, & Mourning Dove

Habitat

Habitat Effects

Stem Density



Habitat Effects

6 species



Effects

Results (for "forest" birds)

Height

Taller trees are better

Stem Density

More trees are better

Understory Density

Denser vegetation is better

Species Richness

?



“Forest Birds”

- **Increased density**
 - In more forested landscapes
 - On sites with trees that are:
 - taller, denser, & species rich
- **Increased nest success**
 - Farther from agricultural edges
 - On sites with taller and denser trees
 - On sites with denser understory

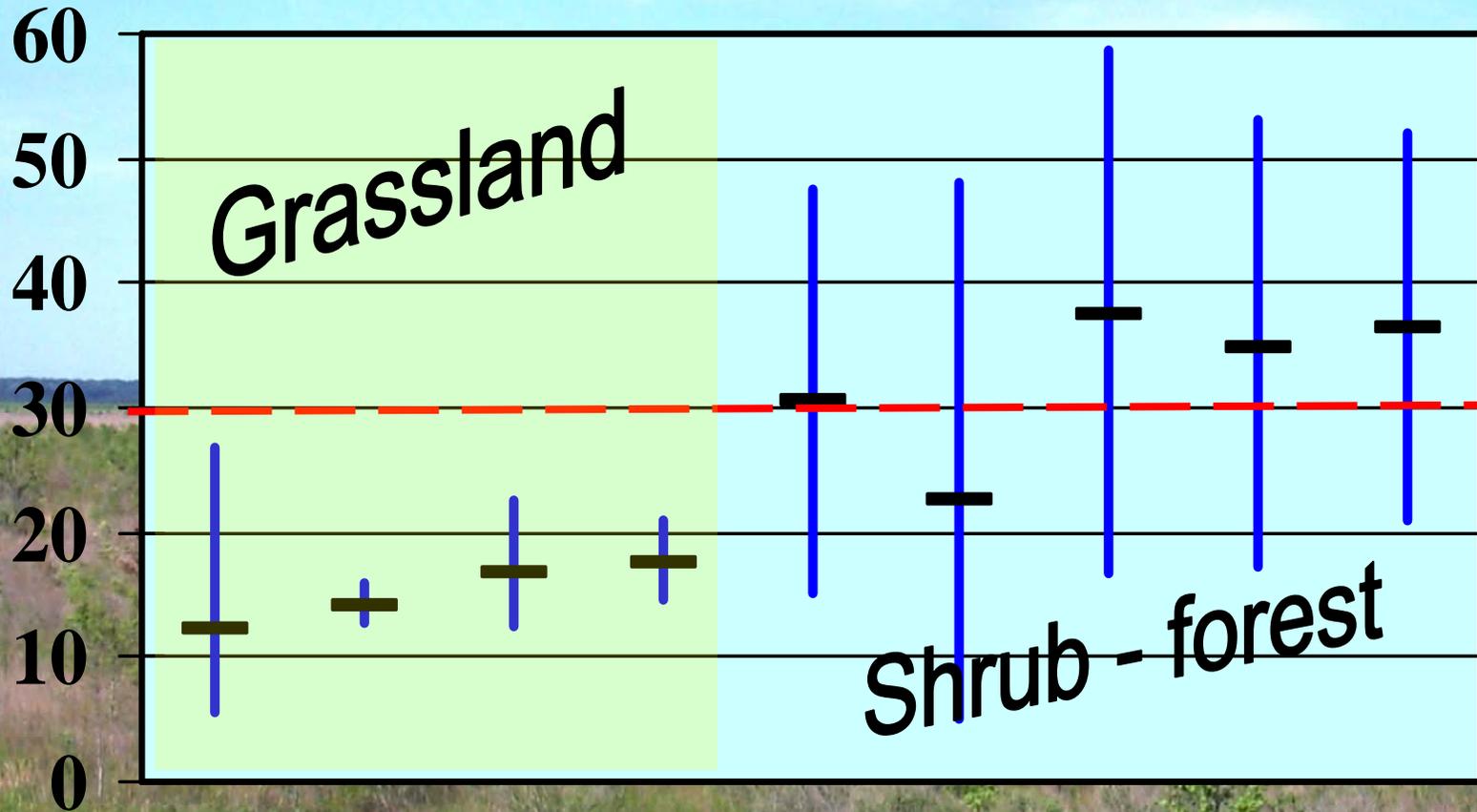


Where is Important !

- Agricultural landscapes
 - More “grassland” birds
 - Probable “sinks” populations
- Forested landscapes
 - More “shrub-scrub” birds
 - Probable “source” populations



Nesting success (CI_{95%})



NOMO RWBL MODO DICK NOCA YBCU INBU OROR YBCH

“What” is also Important !

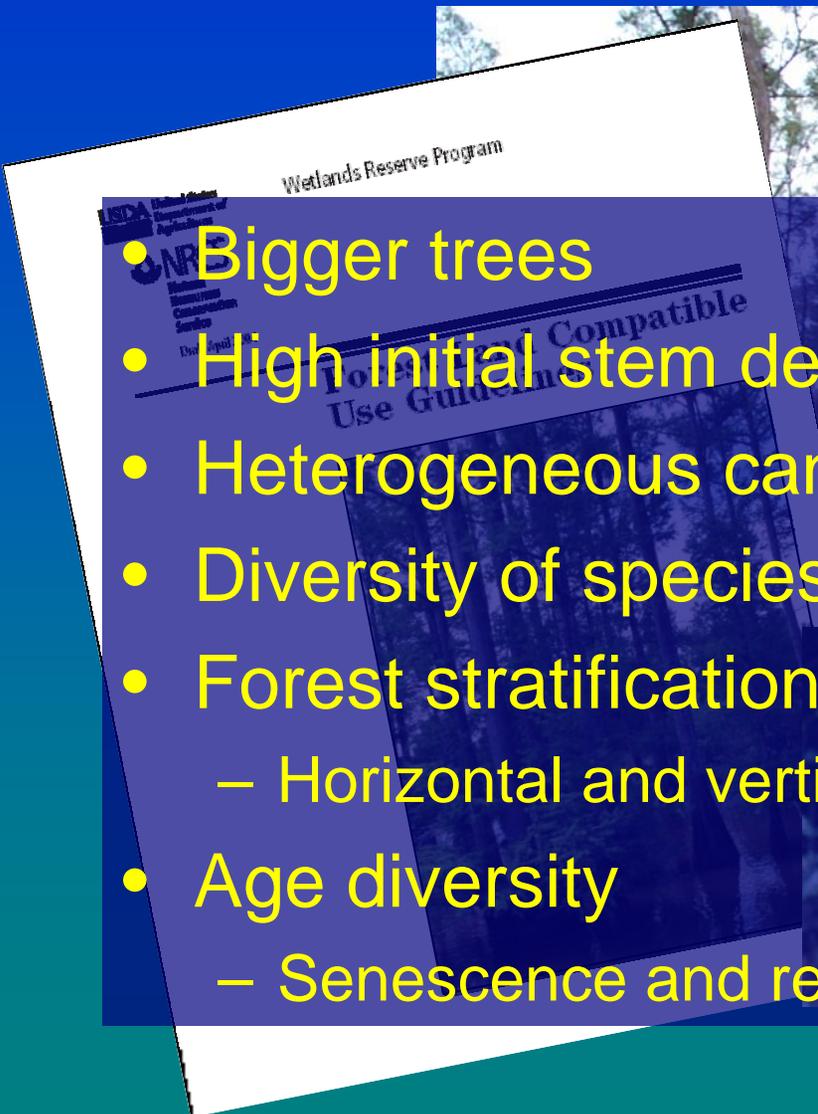
- Taller trees
- High stem density
- Heterogeneous understory
 - Gaps in canopy
 - Dense understory thickets
- Diversity of tree species
- Forest stratification
 - Horizontal and vertical



Desired Stand Conditions



Forest Resource Conservation Working Group

- 
- Bigger trees
 - High initial stem density
 - Heterogeneous canopy
 - Diversity of species
 - Forest stratification
 - Horizontal and vertical
 - Age diversity
 - Senescence and regeneration



Thanks

- Field personnel
 - S. Somershoe, R. Wilson
- Public land managers
 - USFWS
 - USFS
 - MS Dept. Wildlife
- Private landowners
- WRP coordinators

A FOREST REBORN

The largest bottomland hardwood reforestation project in the country is occurring in these fields. A diversity of native trees is being planted to restore the ecological integrity of this vast southern swamp. Benefits already include new wildlife habitat, cleaner water, and more outdoor recreational opportunities.

The success of this project is dependent on Partnerships. THE NATIONAL WILD TURKEY FEDERATION has stepped boldly forward with significant contributions to provide the catalyst needed to begin the work. Their efforts set an example for other critical Partners who champion the cause of conservation.



Questions ?

