

Population Ecology and Habitat Relationships of Northern Bobwhites in Southwestern Ohio

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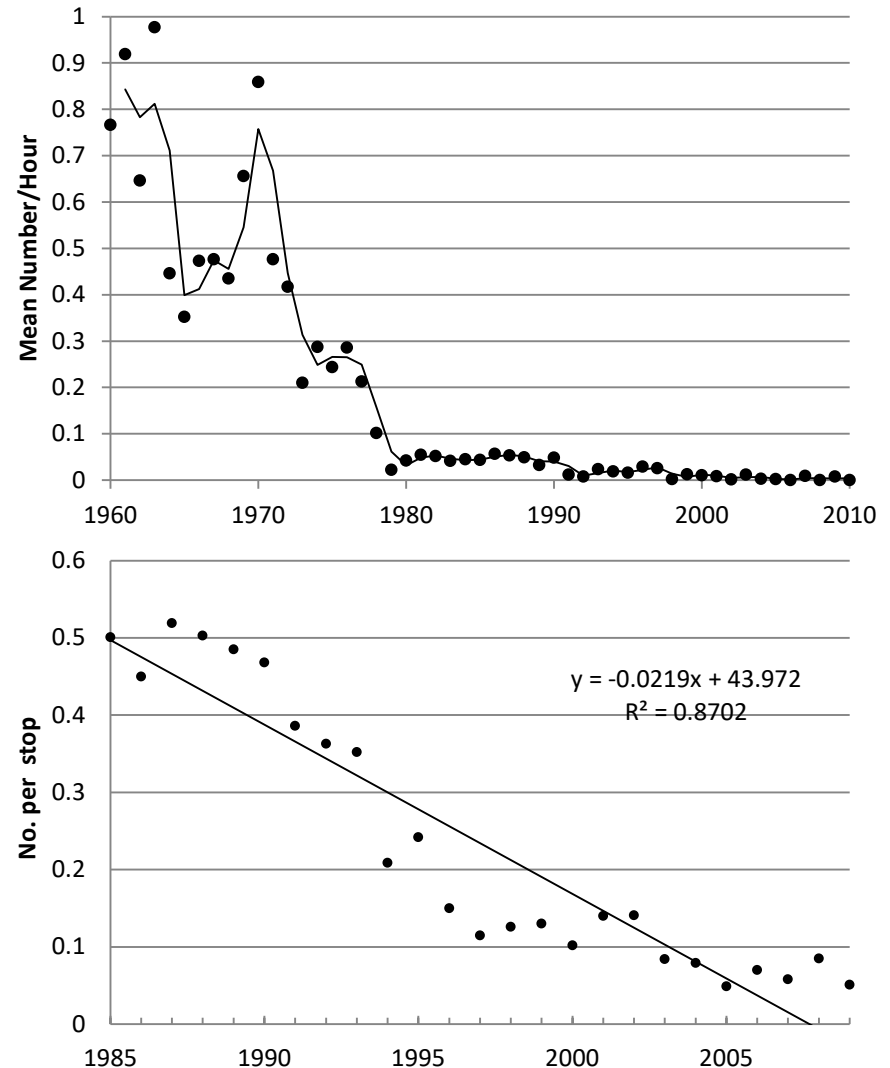
Ohio Bobwhite Population Trends

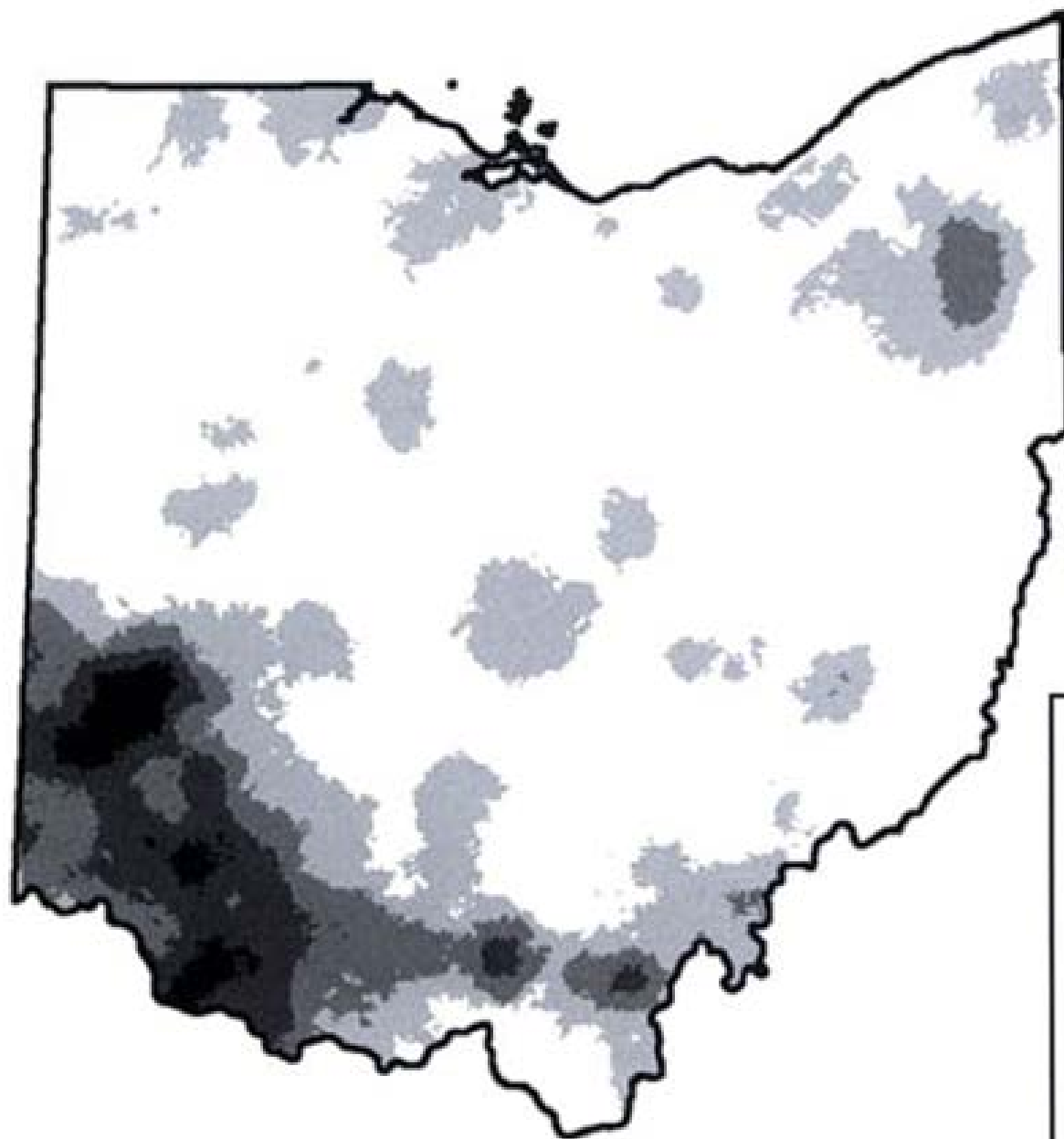
- Christmas Bird Counts:

Population in decline even before severe winters of 1977 and 1978.

- Ohio Division of Wildlife Whistle Counts:

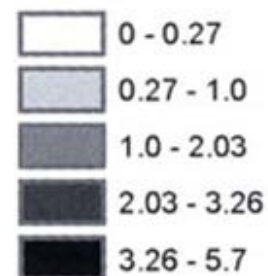
Decline has continued despite Conservation provisions of Farm Bills implemented since 1985

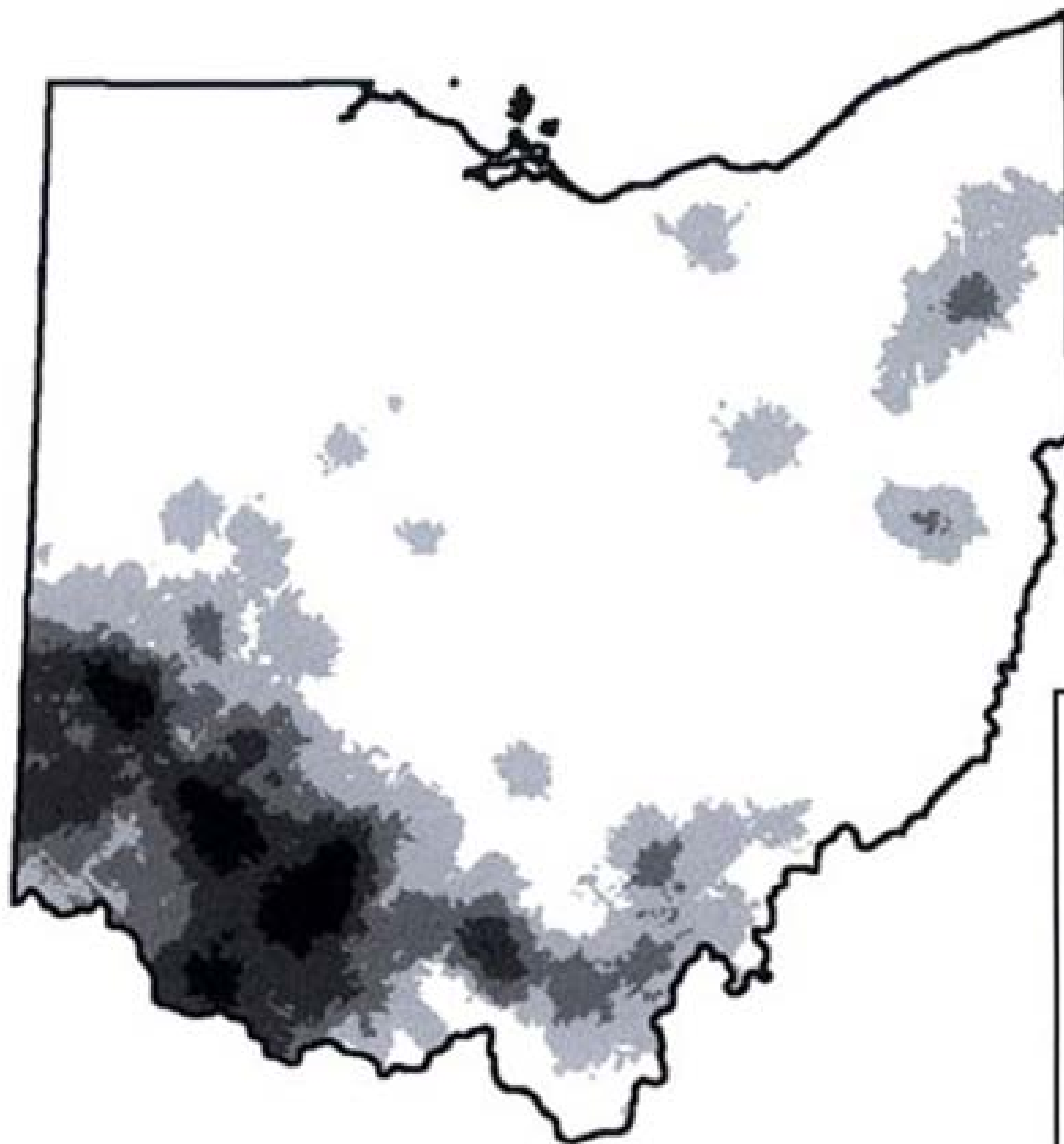




Once distributed statewide, the detectable range of NOBO in Ohio has contracted to about 25 counties (Spinola and Gates 2008)

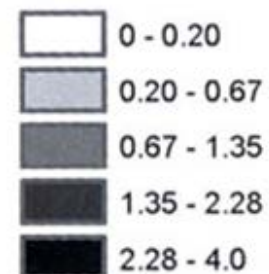
Individuals per stop in 1985



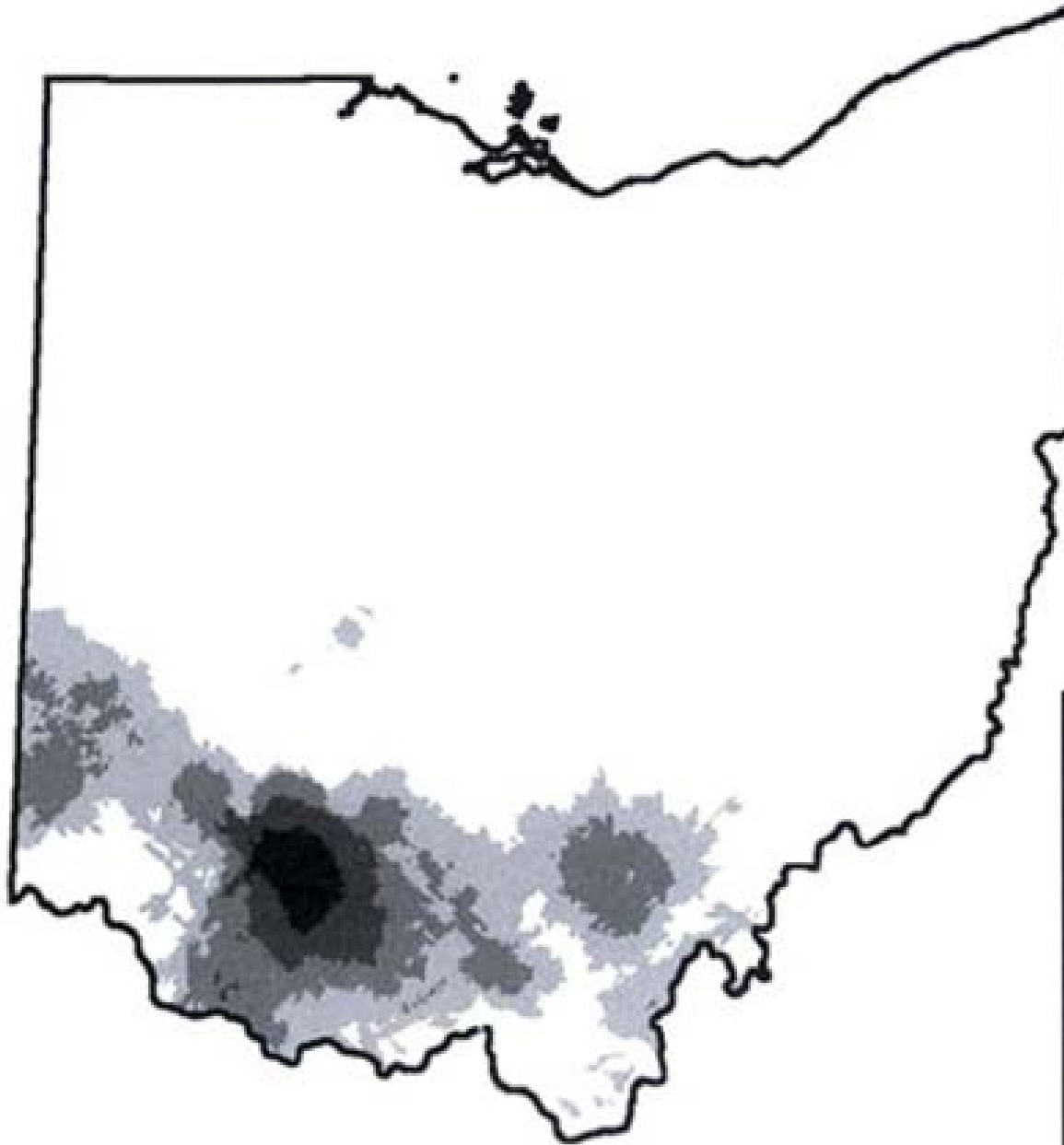


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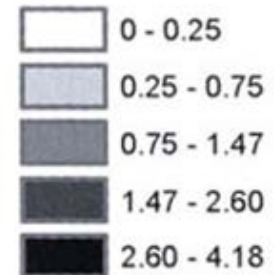
Individuals per stop in 1992



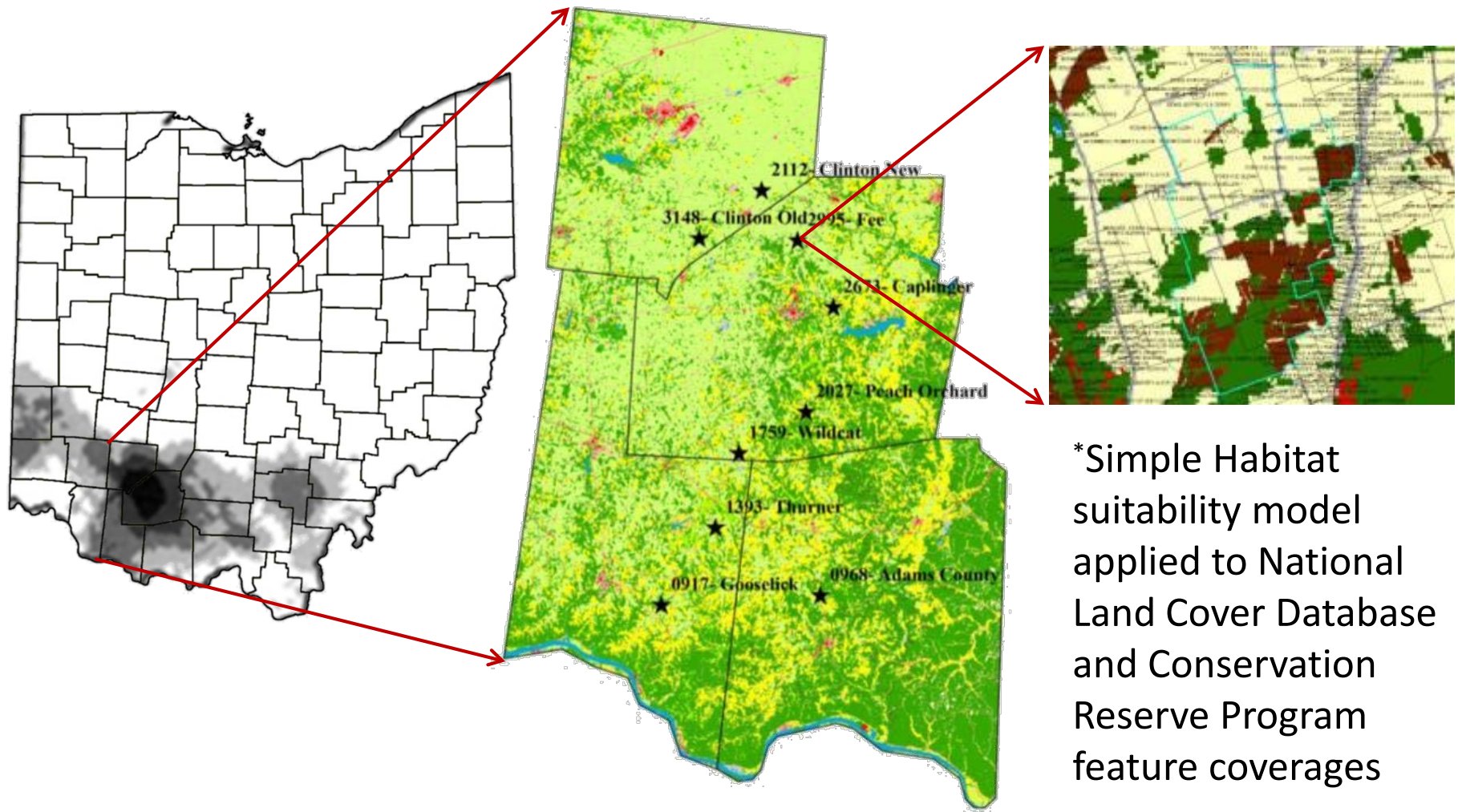
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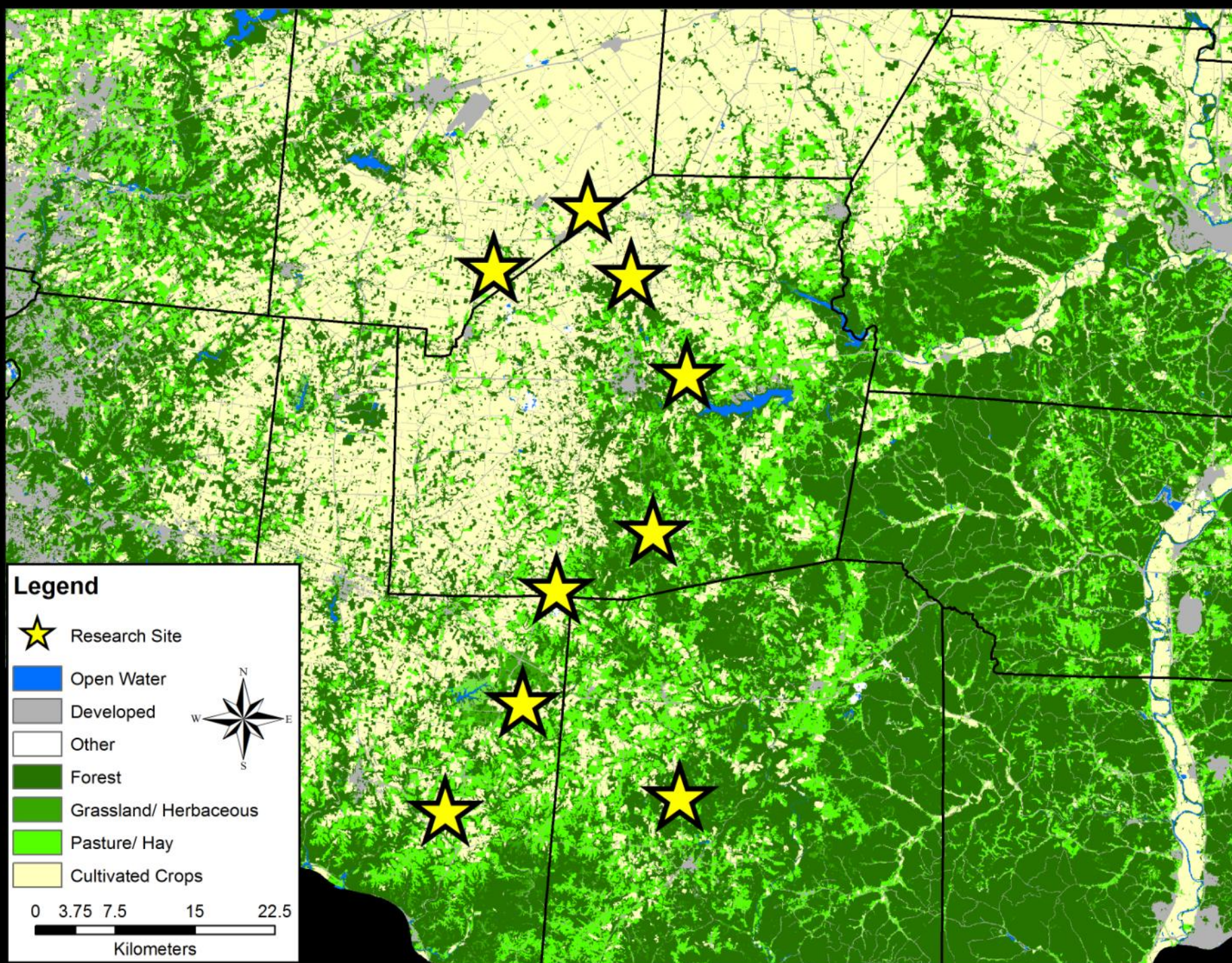
Individuals per stop in 2002



Nine study sites randomly selected* to represent a range of landscape conditions (forest vs. openland) and connectivity where suitable habitat remains on private lands within in the core of NOBO range in Ohio.



*Simple Habitat suitability model applied to National Land Cover Database and Conservation Reserve Program feature coverages

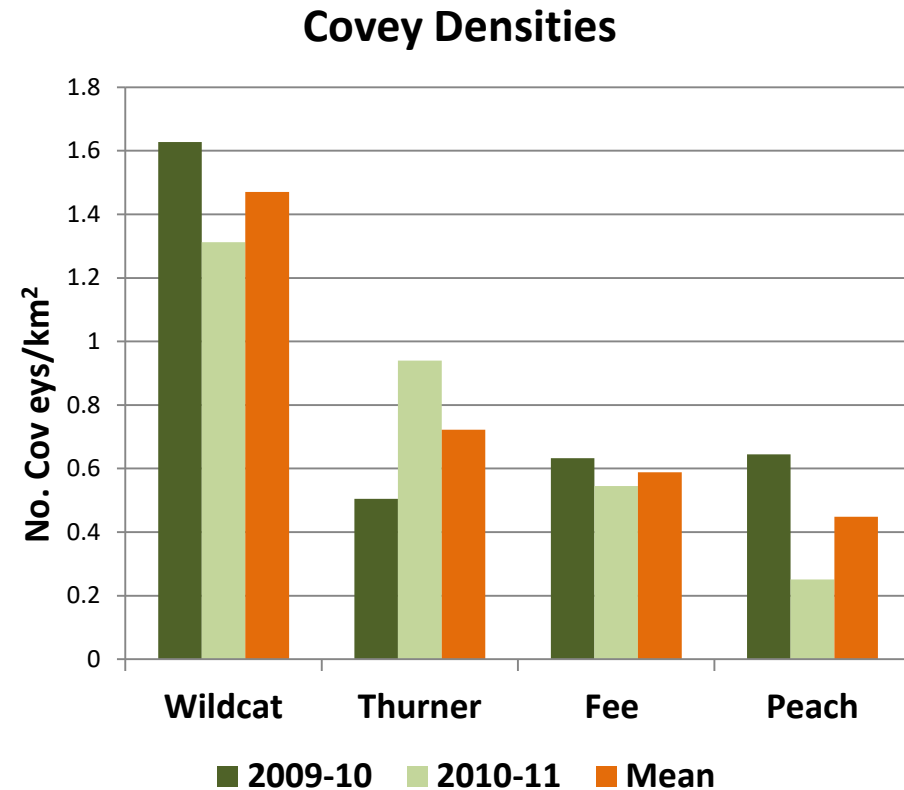
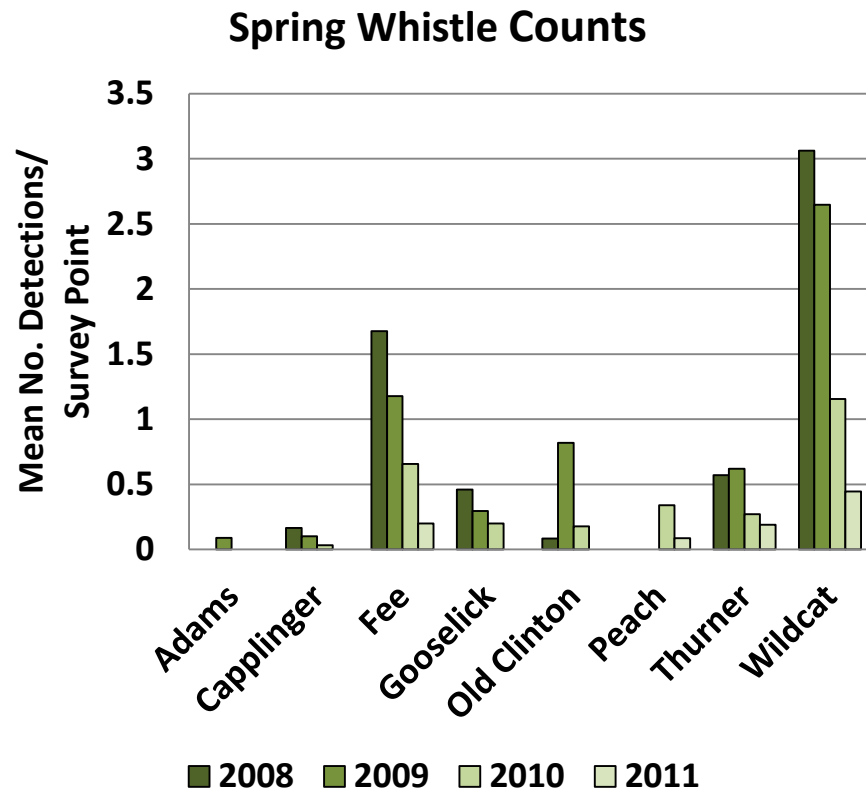


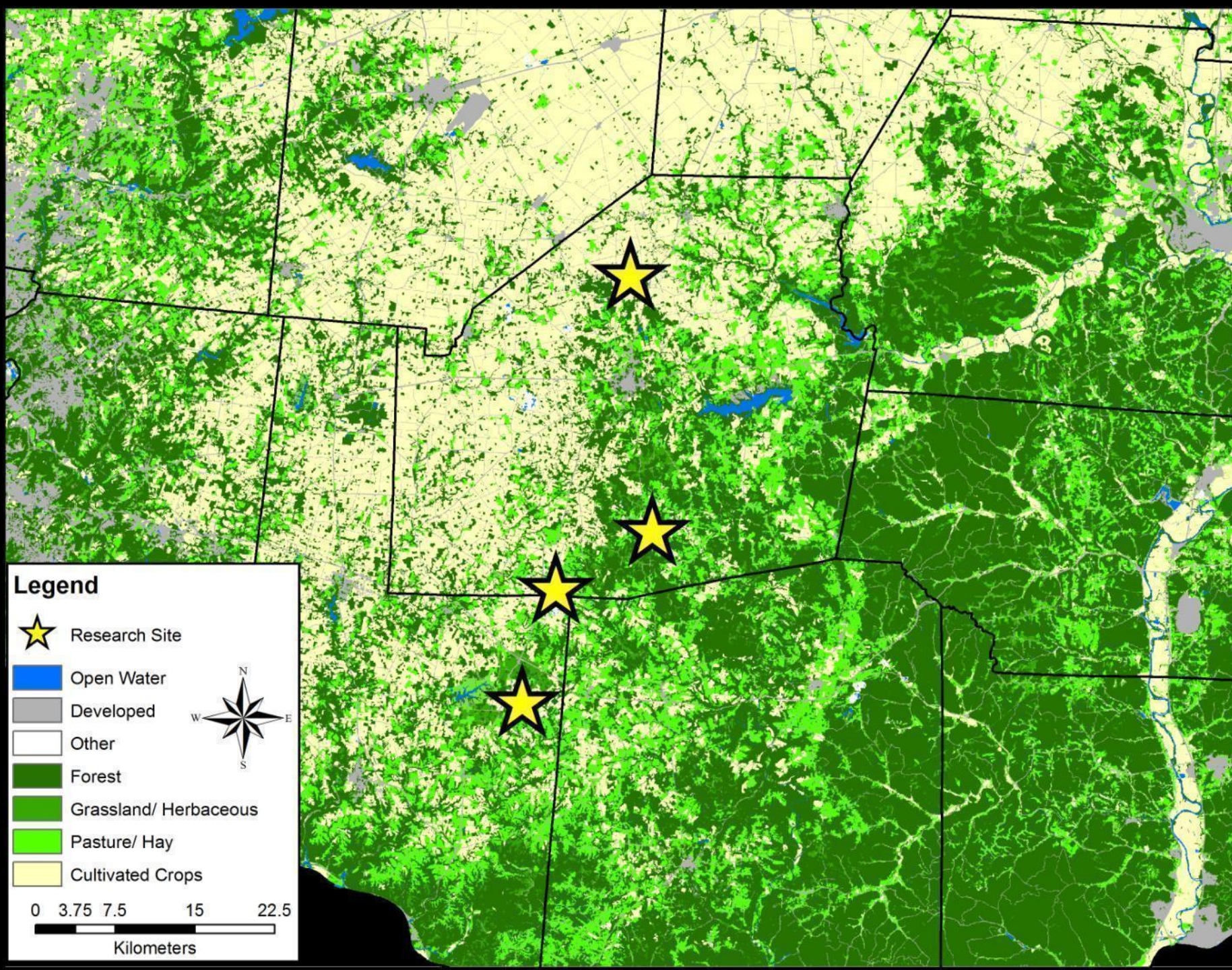
Relative Abundance

- Spring whistle counts on 4-8 study sites during April-June 2008 - 2011
- Intensive searches with pointing dogs and by snow tracking on 4-8 study sites during October-March 2008-09 through 2010-2011.
- Covey call counts on four study sites during October-December 2009-10 and 2010-11.
- Radio-marked coveys located daily on 4 sites during October-March 2008-9 through 2010-2011.

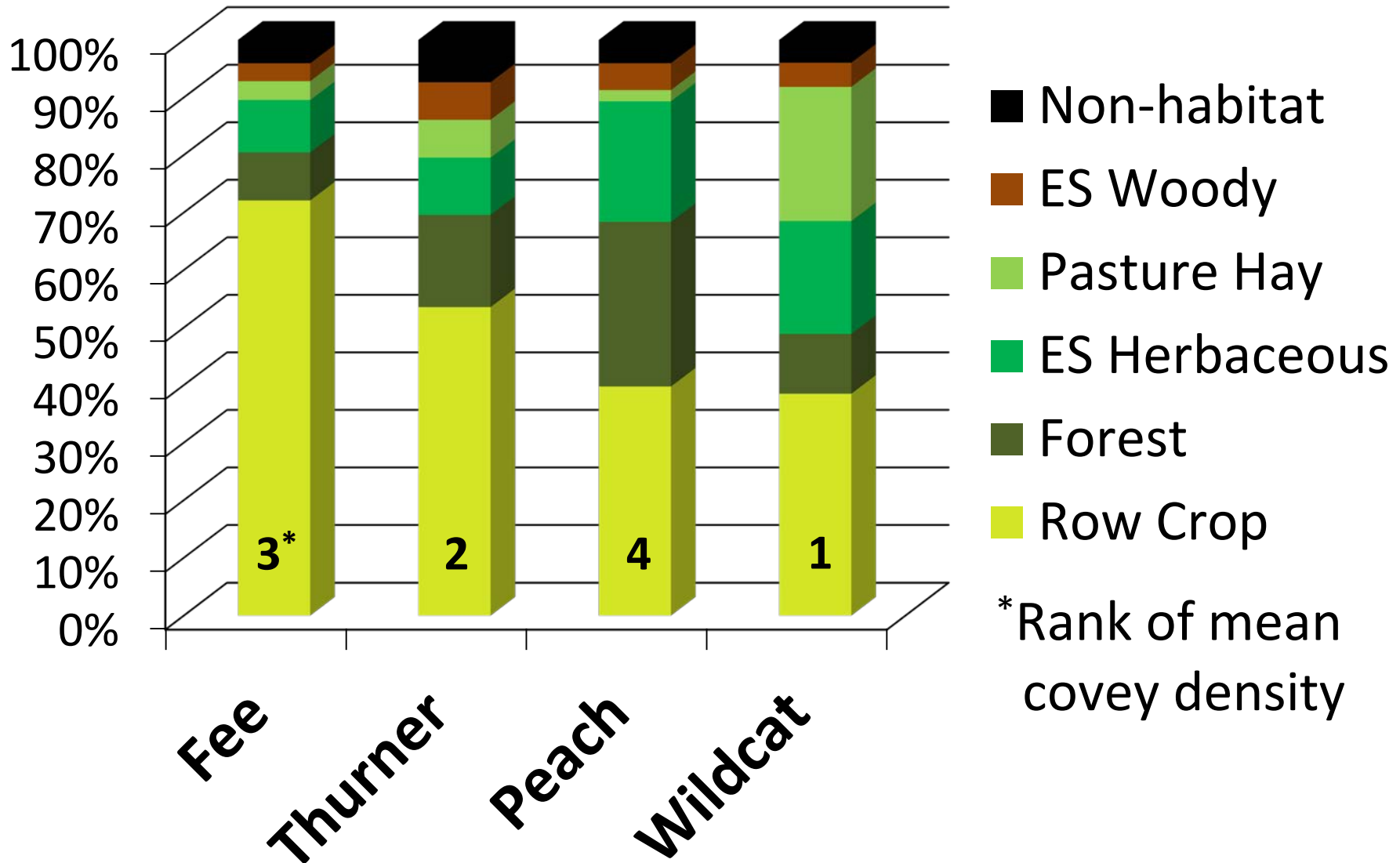


Spring whistle counts, fall covey counts, and intensive searches revealed substantial NOBO densities on only 4 of 8 study sites



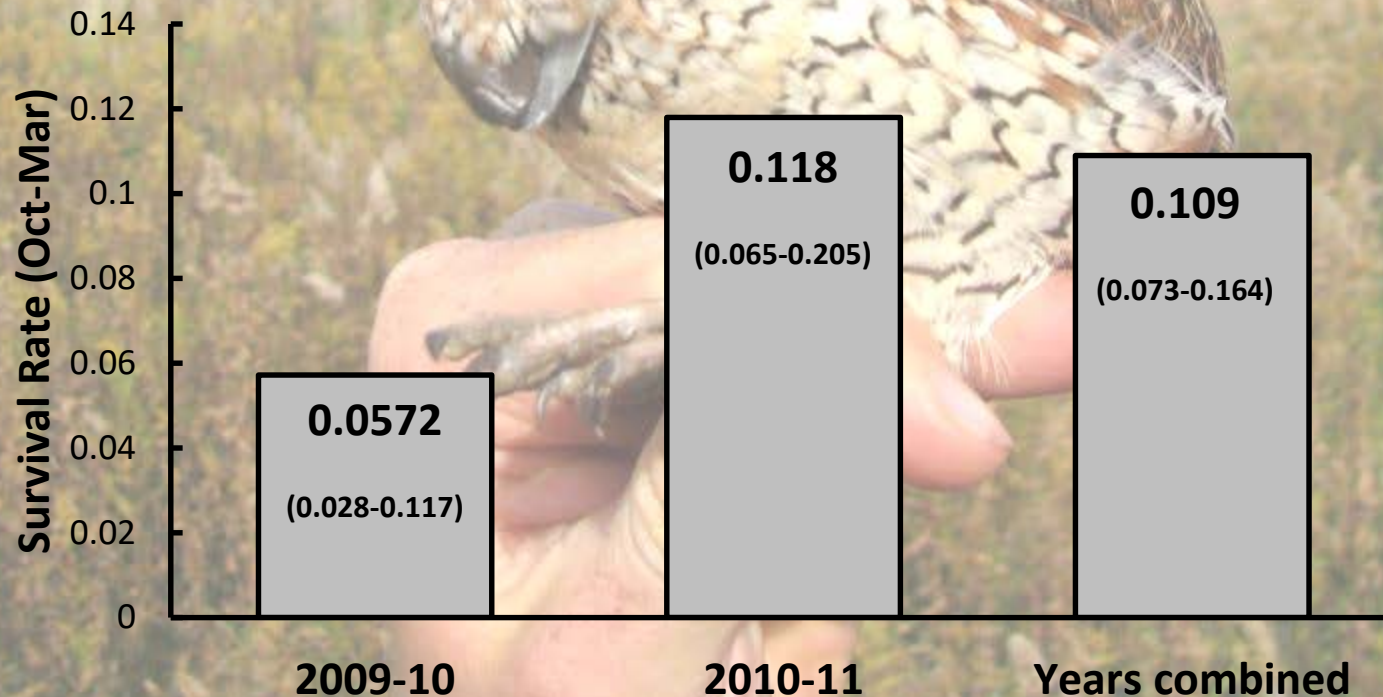


Habitat composition



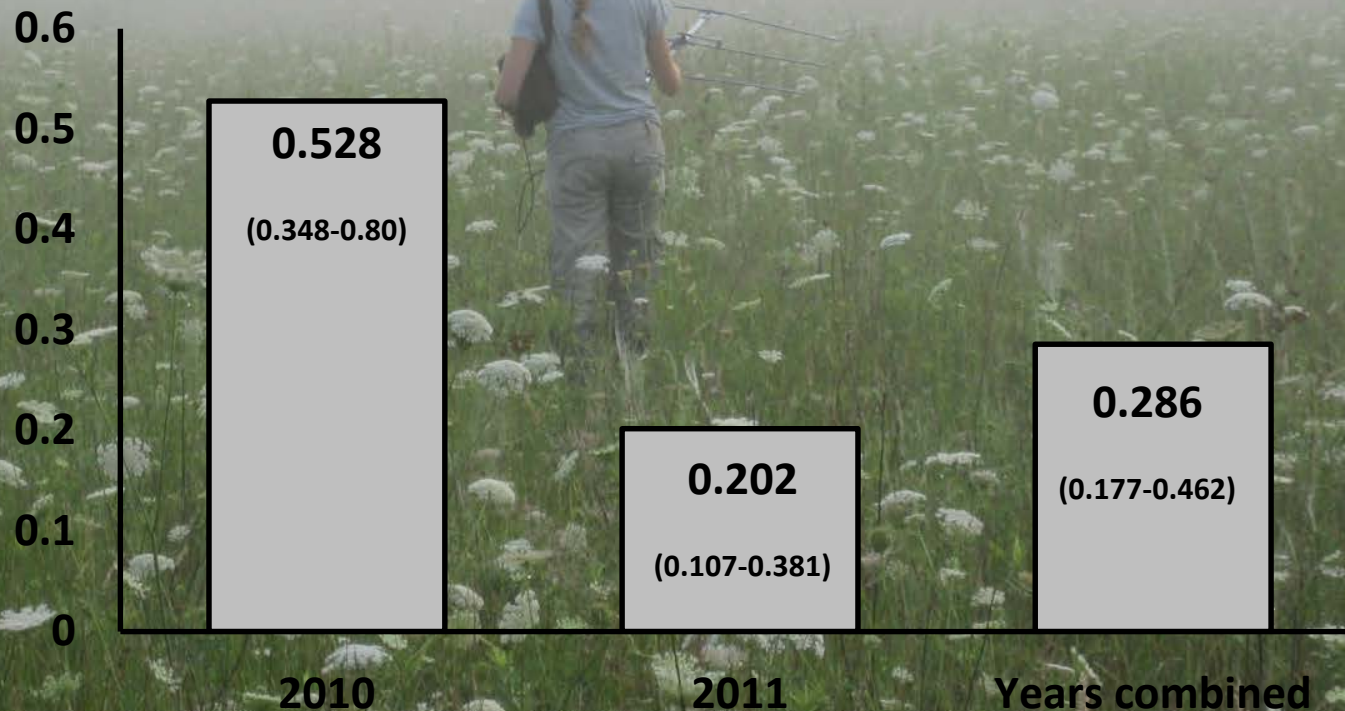
Demographic Parameters: Fall Winter Survival

- Kaplan-Meier estimates of adult and juvenile survival (October-March 2009-2011) from radio-marked birds at Wildcat, Thurner, Fee, and Peach Orchard sites.



Demographic Parameters: Summer Survival

- Kaplan-Meier estimates of adult survival (Apr-Sep) from radio-marked birds at Wildcat, Thurner, Fee, and Peach Orchard sites



Demographic Parameters: Nest Behavior

Liberati M.S. Thesis 2012 (exp.)

- Renesting rate = 0.647 (95% CI = 0.420-0.874)
 - (11 of 17 females renested after failed nests)
- Double-brooding rate = 0.250 (95% CI = 0.005-0.495)
 - (3 of 12 females renested after hatching a clutch)
- Male incubation rate = 0.432 (95% CI = 0.361-0.517)*
 - 8 of 53 (15.1%) radio-marked males incubated nests
 - 9 of 37 (24%) nests incubated by males when gender was determined
 - *Estimated from the relative probabilities of finding radio-marked males vs. females incubating nests (after Collins et al. 2009)

Demographic Parameters: Nest Productivity

Liberati M.S. Thesis 2012 (exp.)

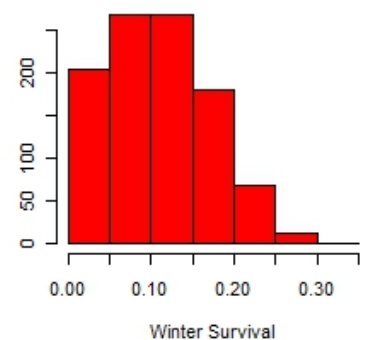
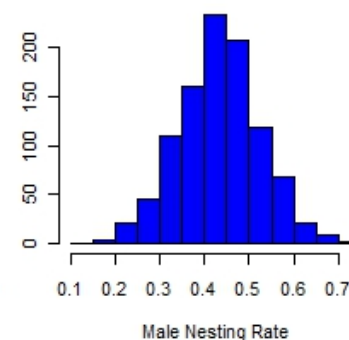
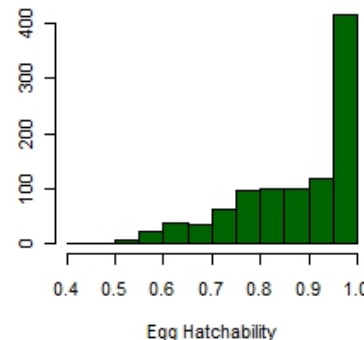
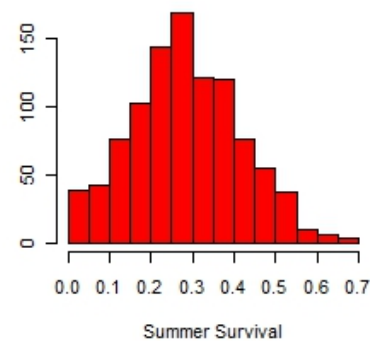
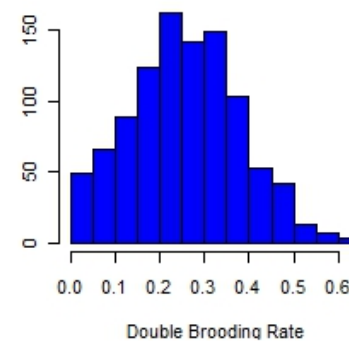
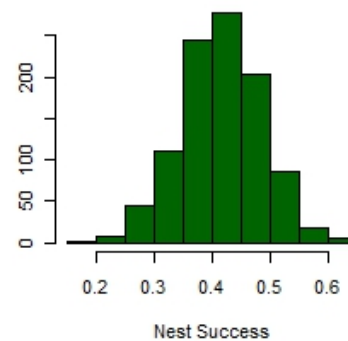
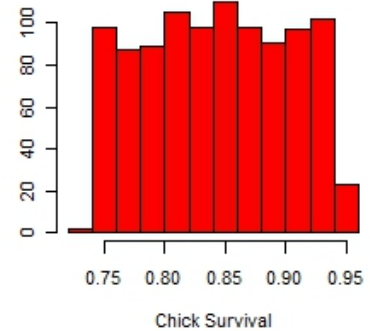
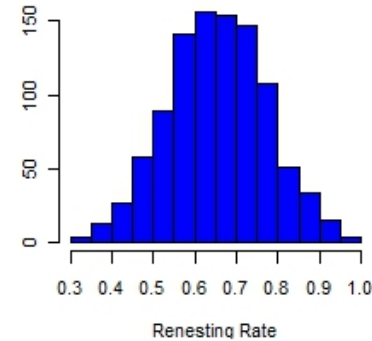
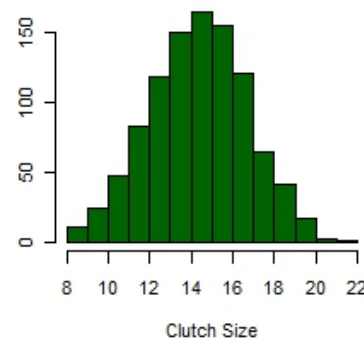
- Apparent Nest Success = 0.415
 - (95% CI = 0.282-0.548, $n = 53$)
- Incubated Clutch Size = 14.4
 - (95% CI = 13.6-15.2, $n = 37$)
- Egg Hatchability = 0.922
 - (95% CI = 0.836-0.988 $n = 21$)
- Chick survival to fledging = 0.843
 - (95% CI = 0.740-0.943)*

*Source: Suchy and Munchel (2000), adjusted from 38 to 30-day hatch to fledging interval

Life-stage Simulation Analysis

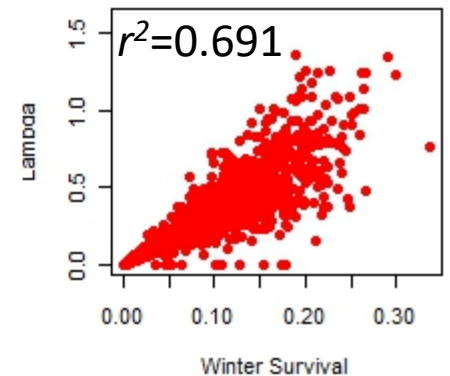
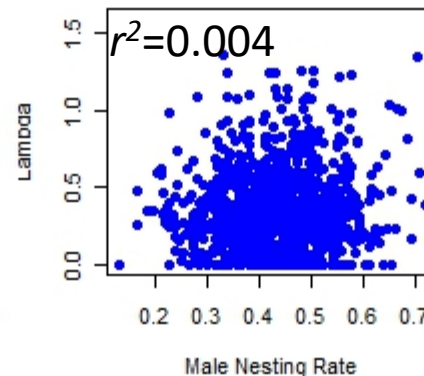
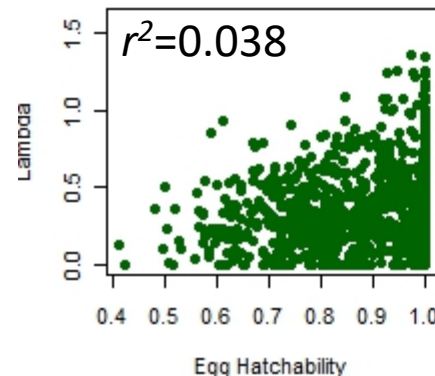
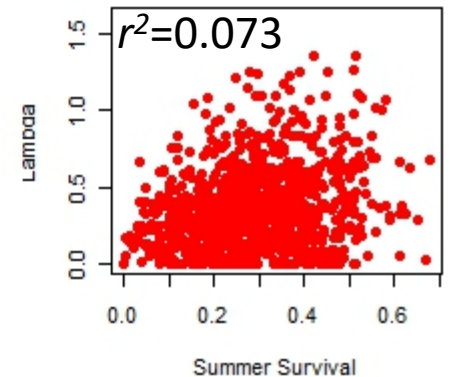
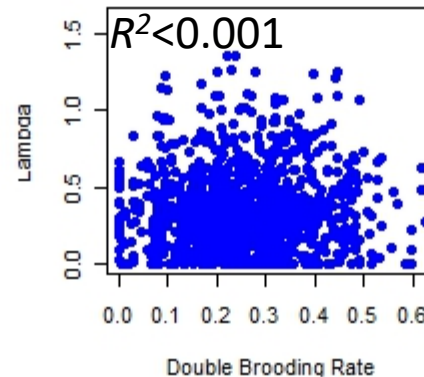
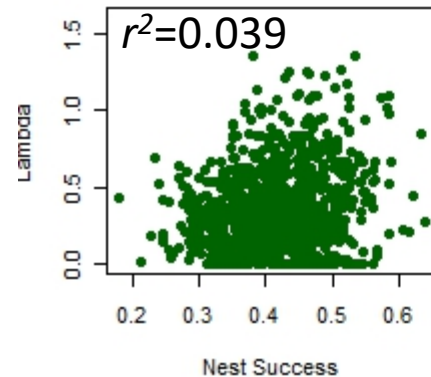
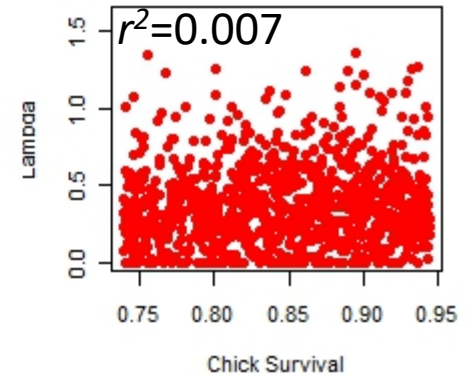
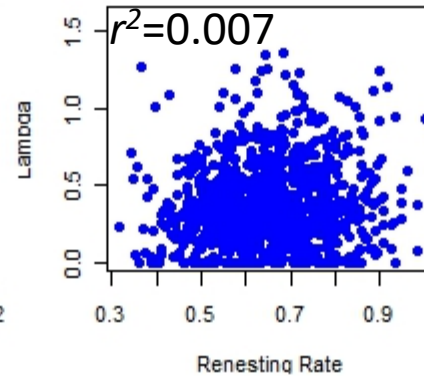
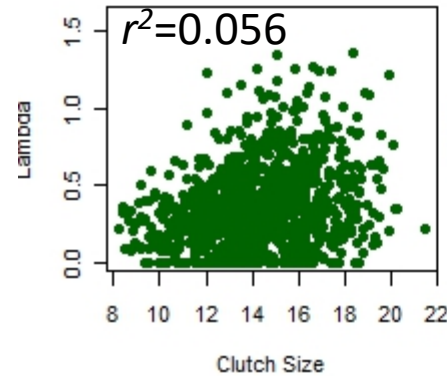
(after Sandercock et al. 2008)

- 8 of 9 demographic parameters modeled using empirical data from southwestern Ohio.
- Randomly selected from normal distribution (mean, sd)
- Modeled population growth rate (λ) after 1,000 iterations.
- Sensitivity of λ to demographic parameters (r^2).



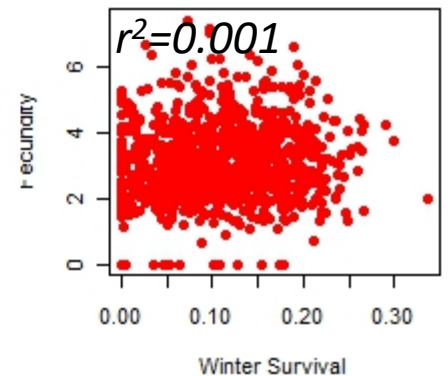
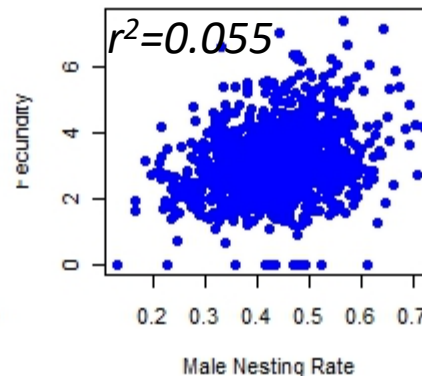
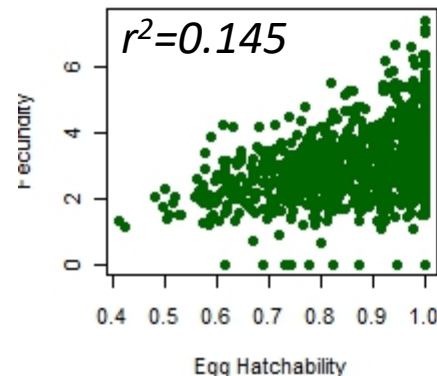
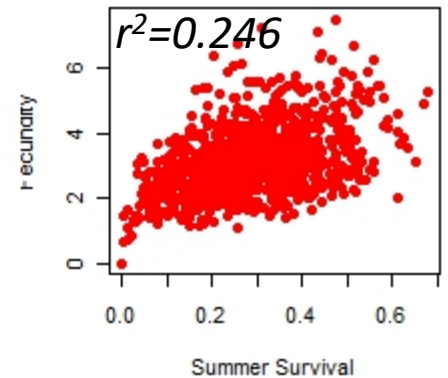
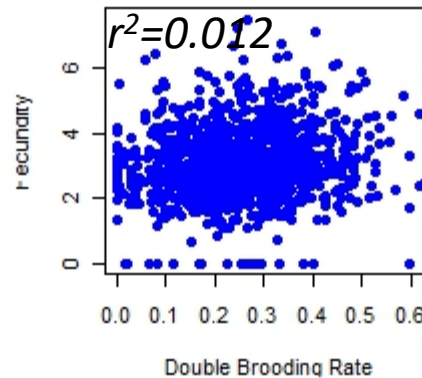
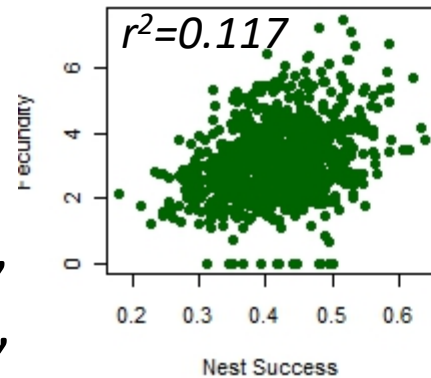
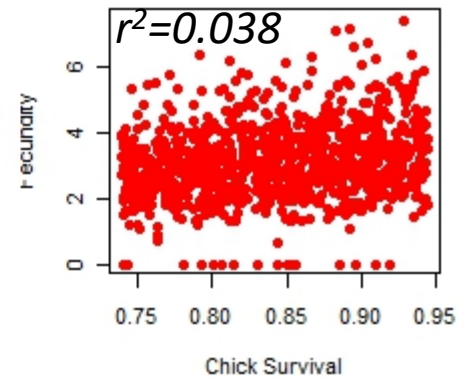
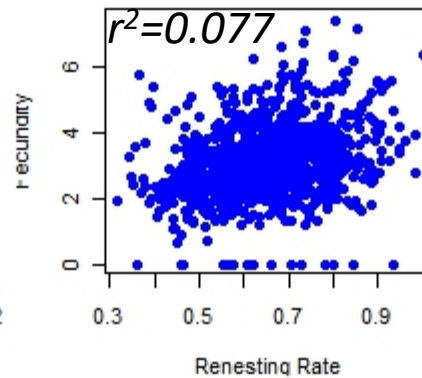
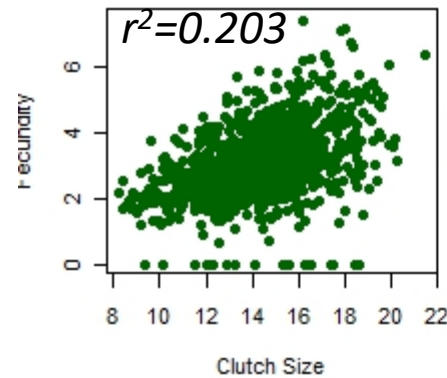
Life Stage Simulation of Pop. Growth:

- Median $\lambda = 0.324$ (0.175 – 0.514 I.Q. range)
- Fall-winter survival dominant, (69.1%) followed by summer survival (7.3%), nest productivity (3.8-5.6%), nesting rates, and chick survival (<1%)

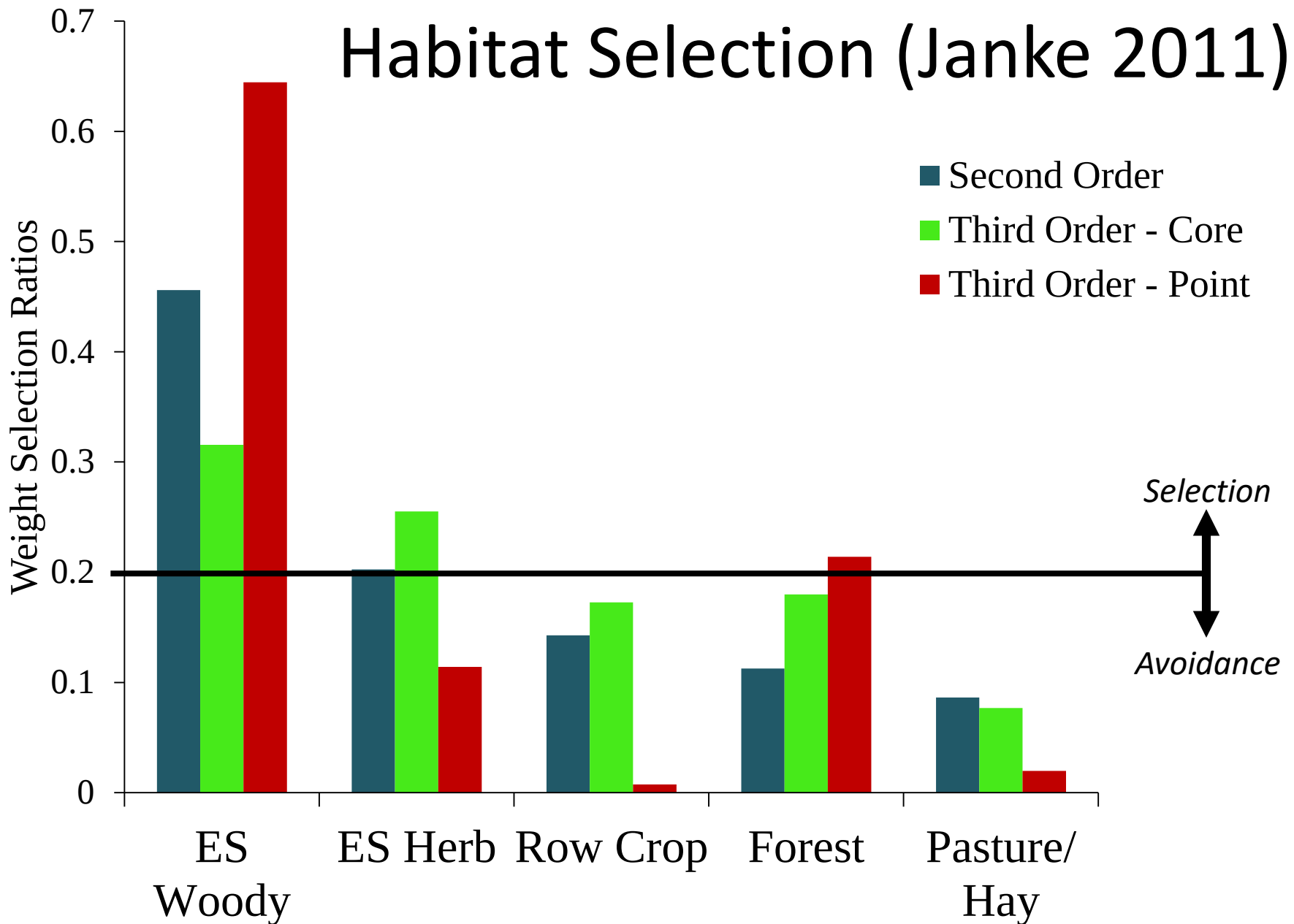


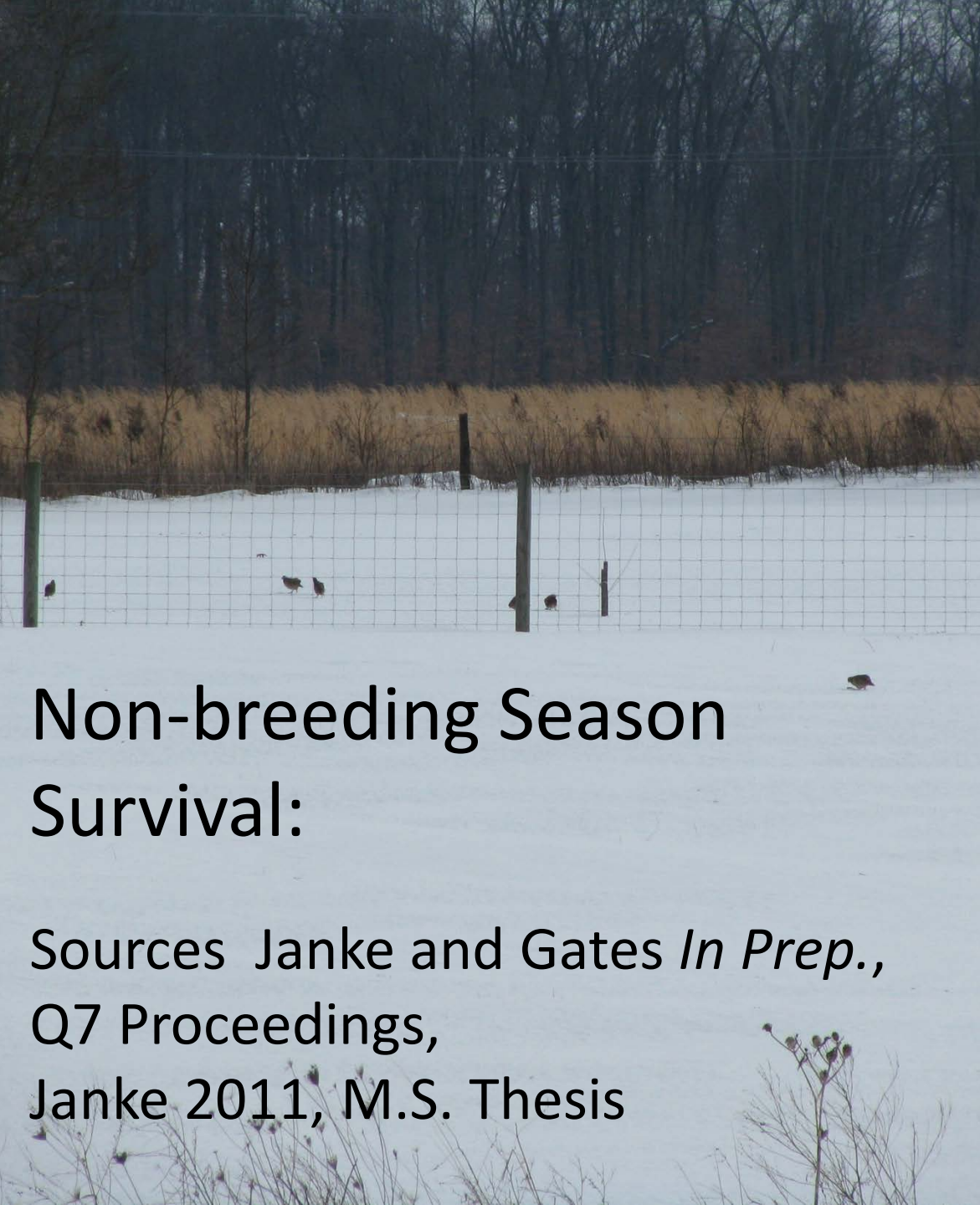
Life Stage Simulation of Fecundity:

- Total fecundity explained 24.9% of variation in λ
- Summer survival dominant, (24.6%), followed by (7.3%), nest productivity (14.5-20.3%), nesting rates, (1.2-7.7%) and chick survival (3.8%)



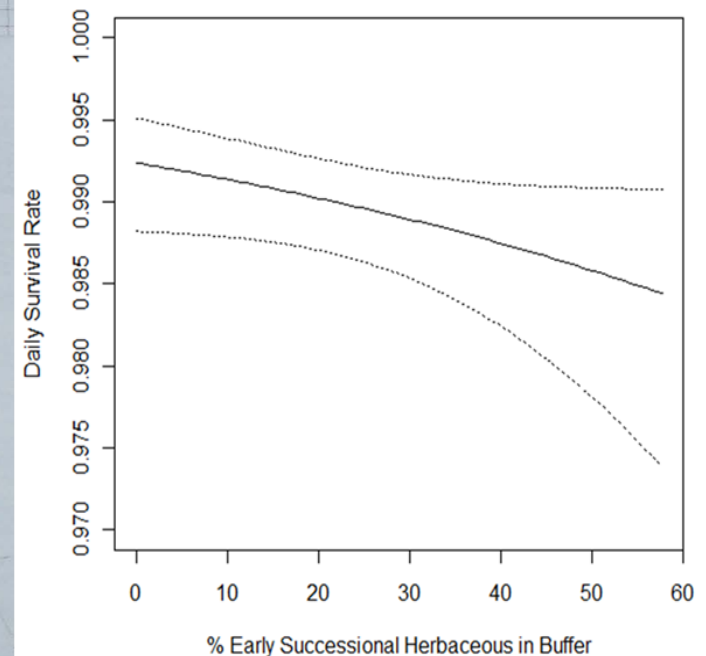
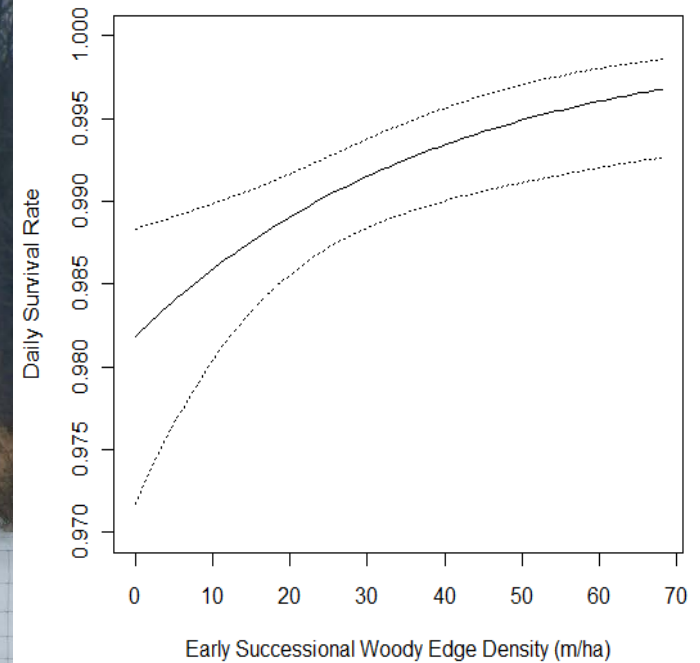
Habitat Selection (Janke 2011)





Non-breeding Season Survival:

Sources Janke and Gates *In Prep.*,
Q7 Proceedings,
Janke 2011, M.S. Thesis



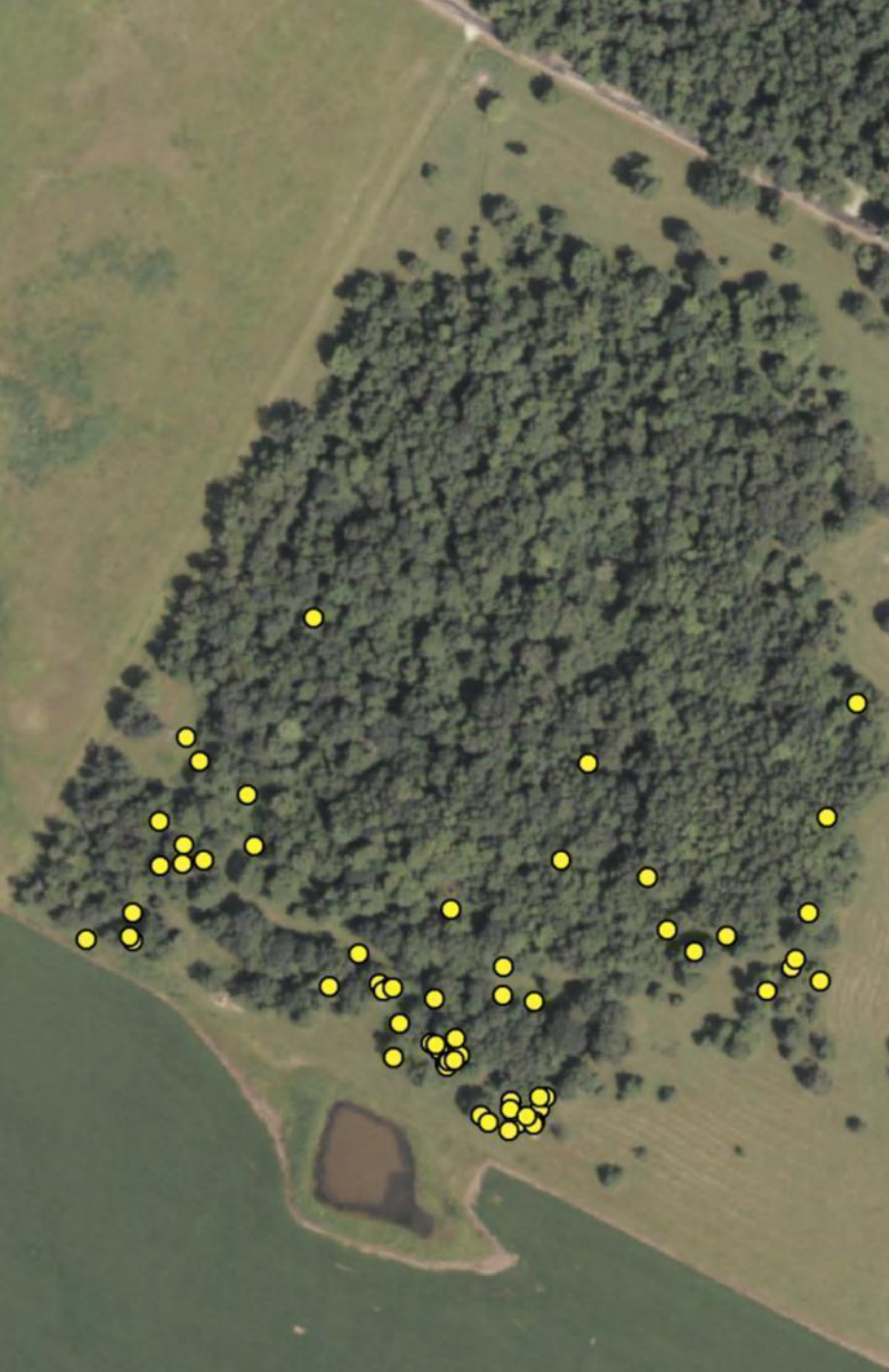


Bobwhites did
not use all
wooded edges
equally....

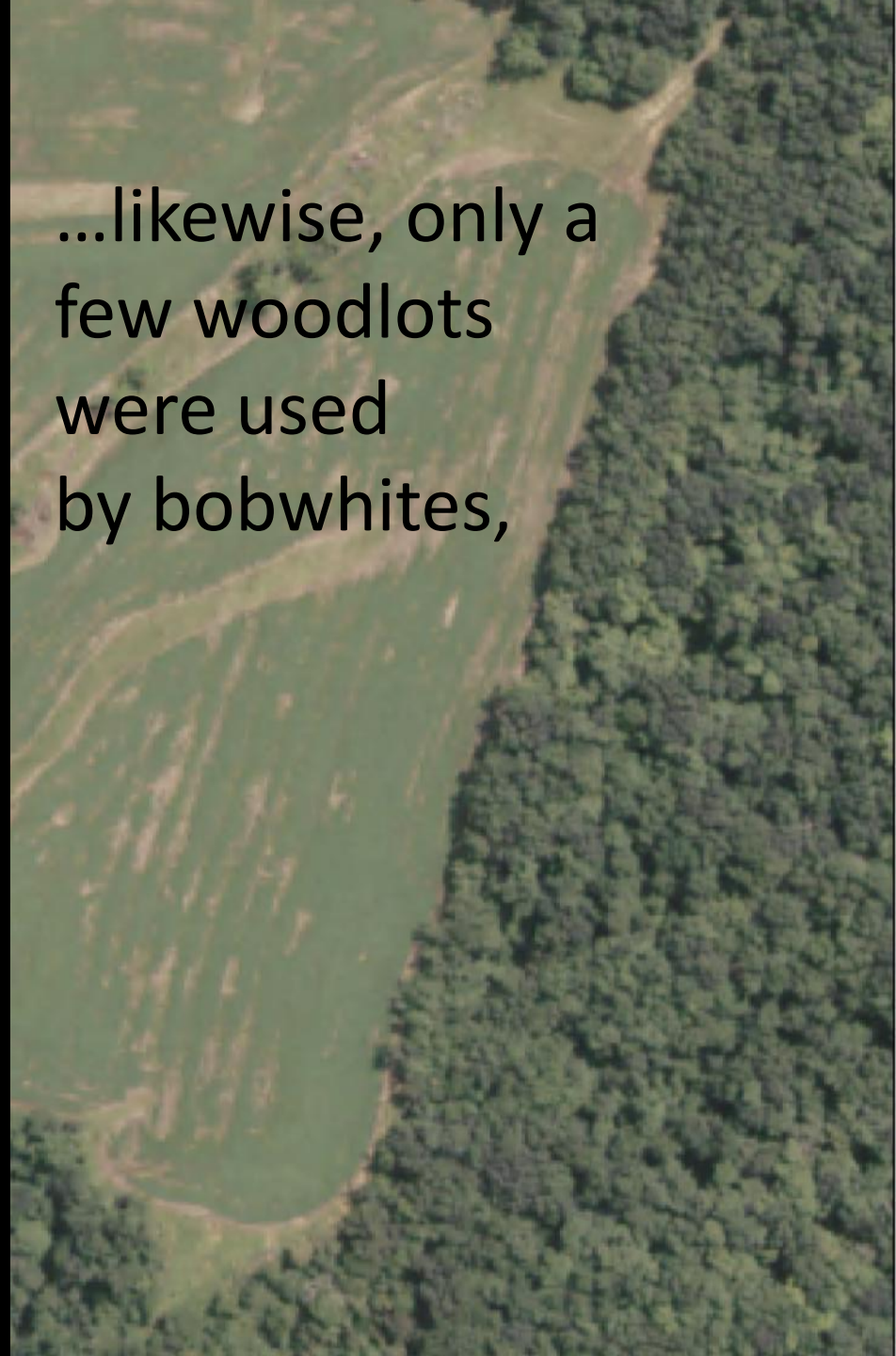
Wooded Edges

Wiley M.S. Thesis 2012 (exp.)





...likewise, only a few woodlots were used by bobwhites,

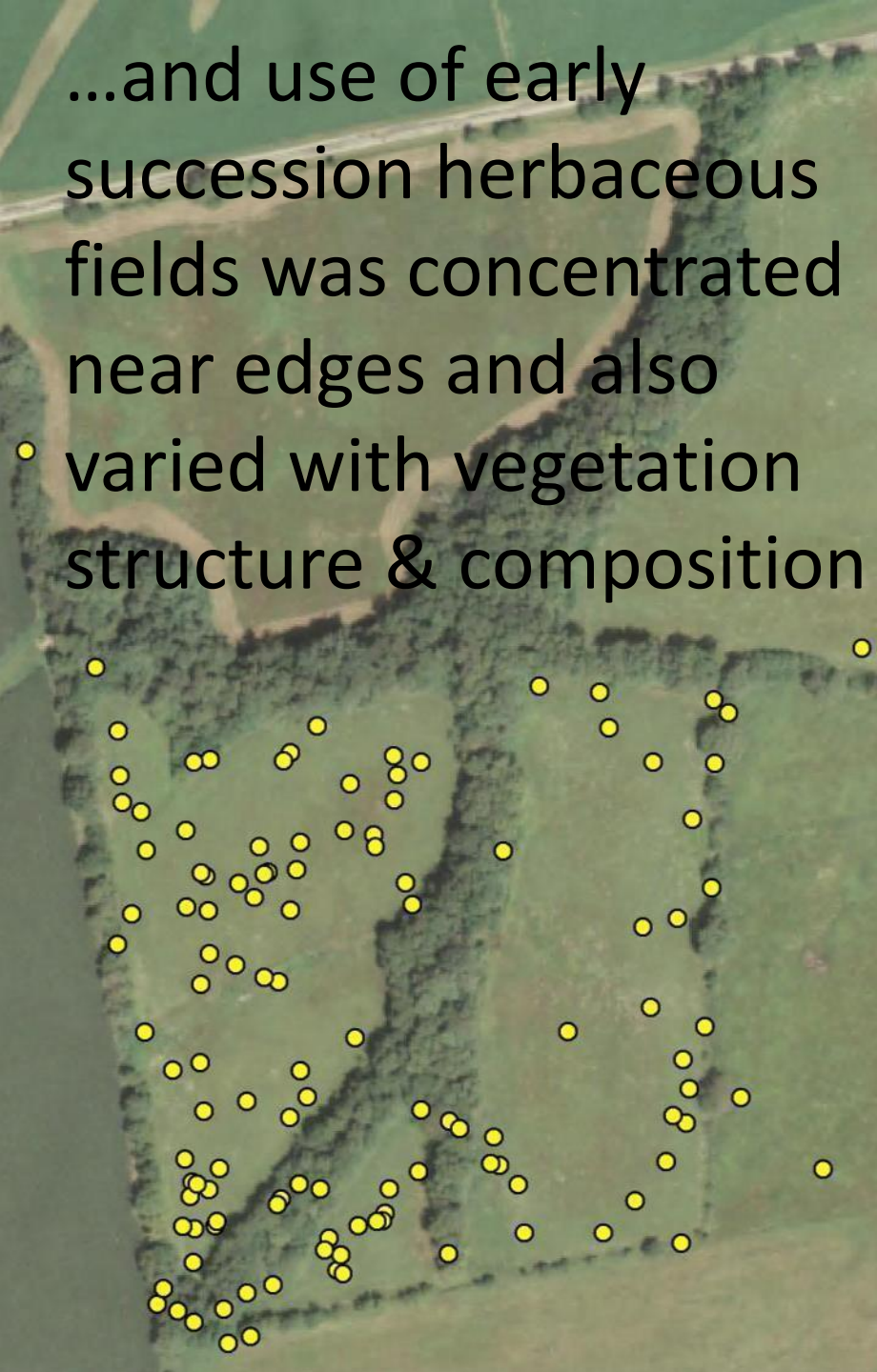


Woodlots

Wiley M.S. Thesis 2012 (exp.)



...and use of early
succession herbaceous
fields was concentrated
near edges and also
varied with vegetation
structure & composition



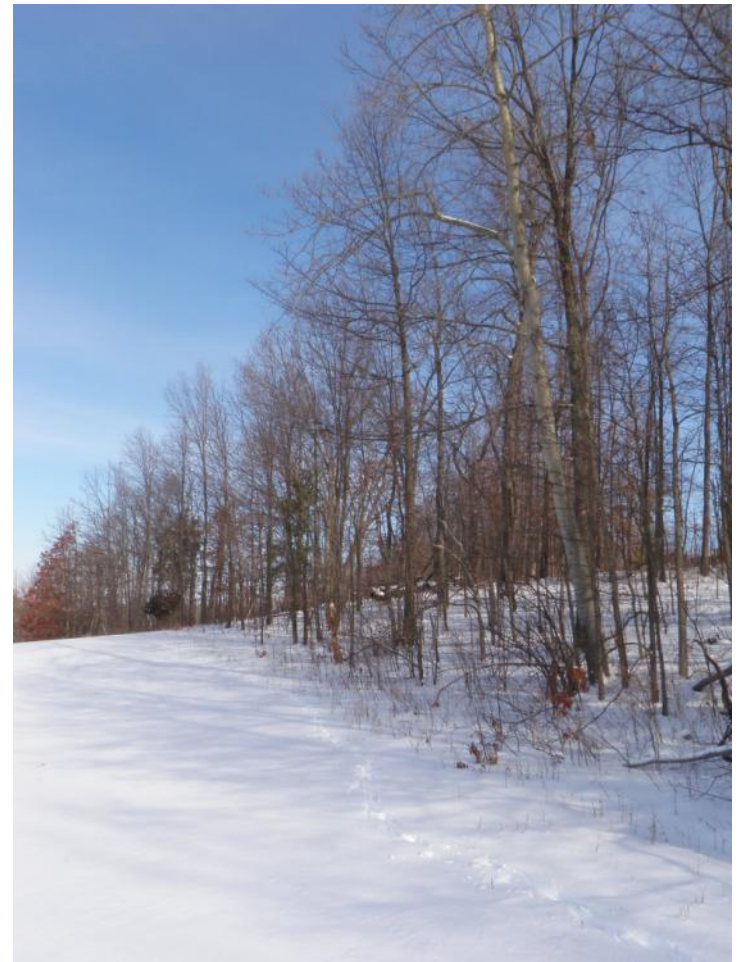
Early Successional Herbaceous

Wiley M.S. Thesis 2012 (exp.)





Conclusions



“One of the characters common to the entire range of quail in the north central region is that every farm has good quail cover from May to December, but that most farms have deficient winter cover or often none at all”

-Aldo Leopold (1931:70)

Conclusions

- Bobwhites have a “patchy” distribution on the landscape, even within the core range in Ohio
 - metapopulations?
- Mortality rates were low compared to other populations.
 - mediated by winter weather?
- Fecundity vital rates , although “normal” were inadequate to sustain the population or to produce surplus individuals to colonize vacant habitats.
 - not dispersal limited?
- Population growth is limited by non-breeding season survival associated with low quality and quantity of suitable woody cover.
 - a woodland bird in OH?

Management Recommendations

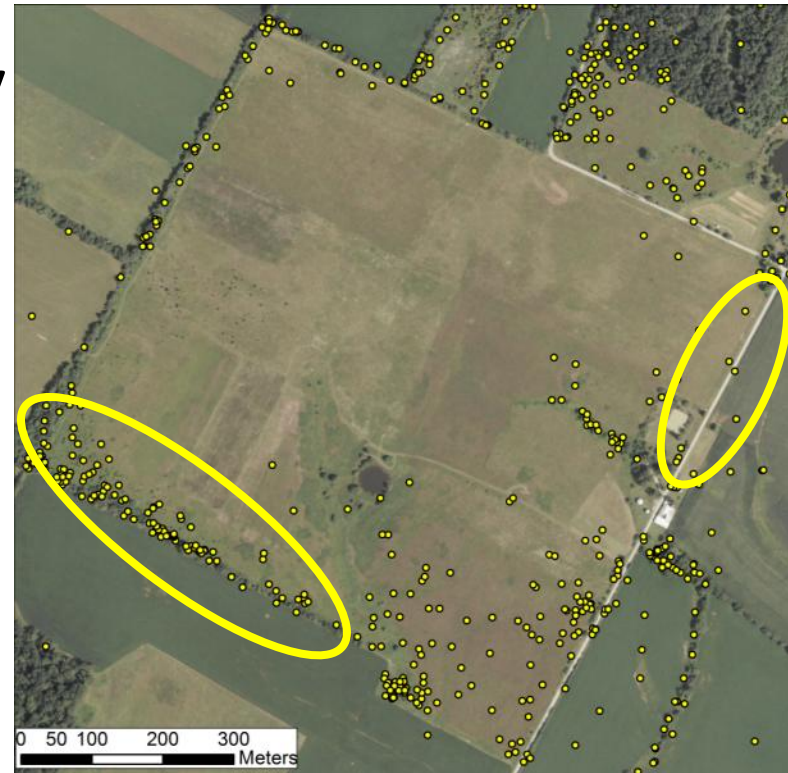


“What about the future of Bob-white in Ohio? That depends upon the amount of food, cover, and protection we provide for these birds. ... It is only when the proper amounts of food, cover, and protection are given that Bob-white can reach his maximum numbers on a farm.”

-Milton Trautman, 1935

Conservation Strategy

- Start small and work outward – overcome Allee effects
- Focus on early succession woody habitats to increase survival and...
- ...increase “Usable Space” to support higher covey densities.
- Continue to conserve and enhance early succession herbaceous habitats (nests and broods)



Edge Feathering

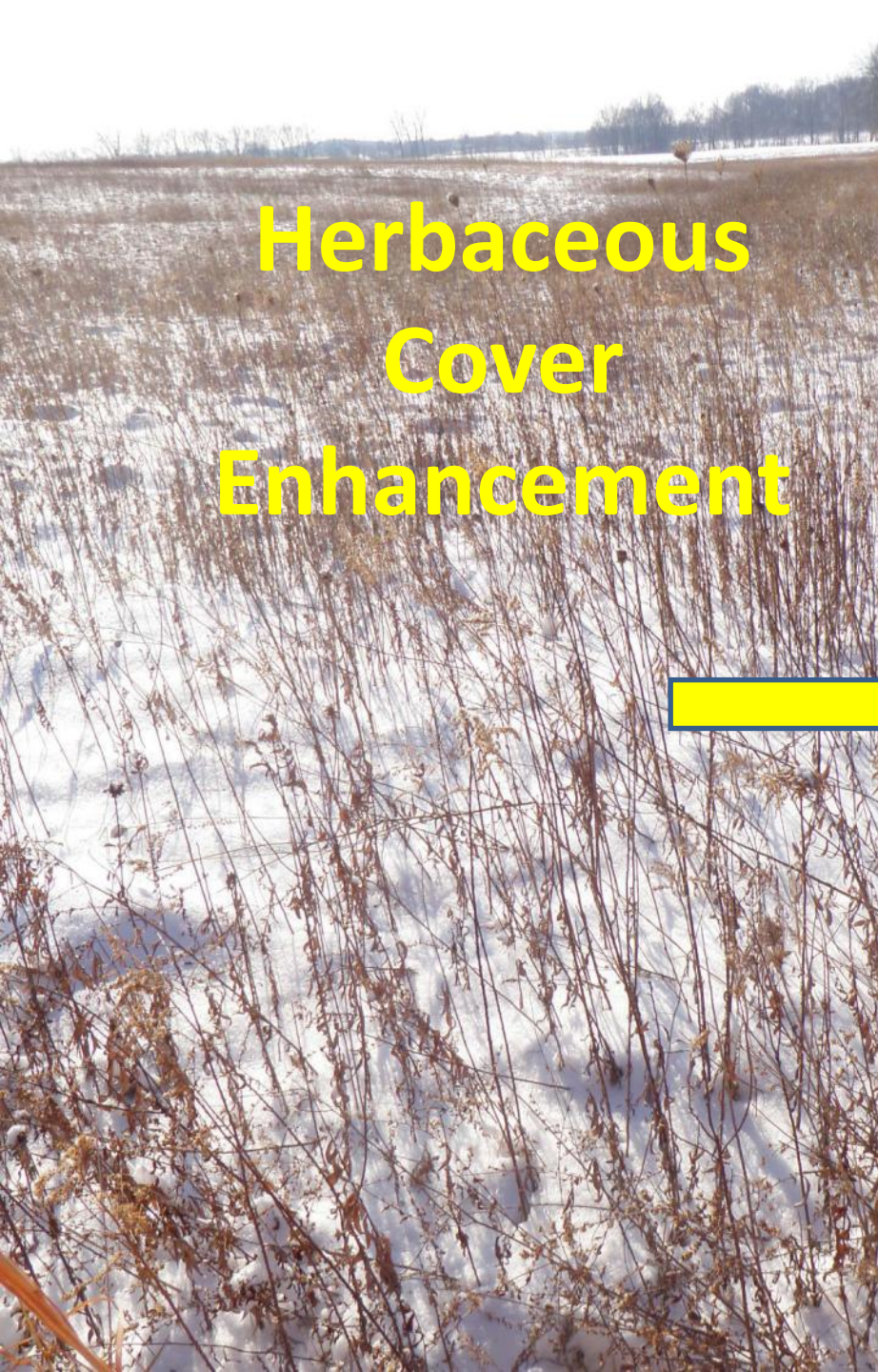
Thin overstory trees to promote early succession woody cover in fencerows and riparian areas, and woodlot edges



Woodlot Management

Open woodlot canopy to promote early succession woody plants (moderate grazing, timber harvest).





Herbaceous Cover Enhancement



Promote warm season
grasses and forbs, allow
some woody cover, especially
near edges.

Acknowledgements

Funding

Ohio Department of Natural
Resources, Division of Wildlife

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Restoration

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Fallsville Wildlife Area

Indian Creek Wildlife Area

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Bryce Adams

Bret Graves

Nan Radabaugh

Mark Peugeot

Laura Jenkins

George Fee

Mark Jones

Don Neel

Marty Staker

John Davis

Chris Grimm

Matt Crowell



**Terrestrial
Wildlife
Ecology
Laboratory**

The Ohio State University
Ohio Division of Wildlife

Questions?



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