MISSOURI QUAIL STUDY:

QUAIL, GRAZING AND USABLE SPACE

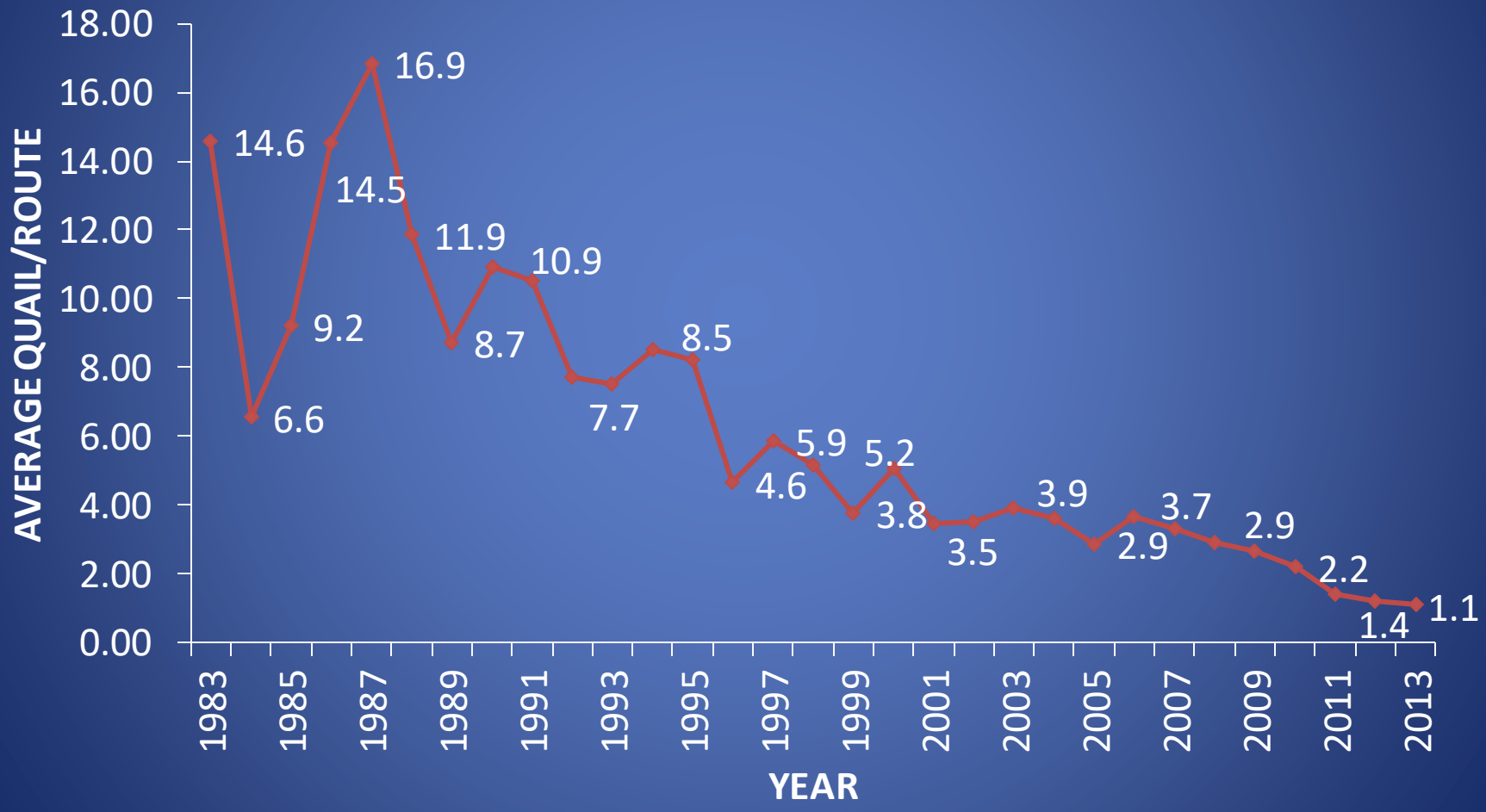
Kyle Hedges
Frank Loncarich
Missouri Department of Conservation

Overview

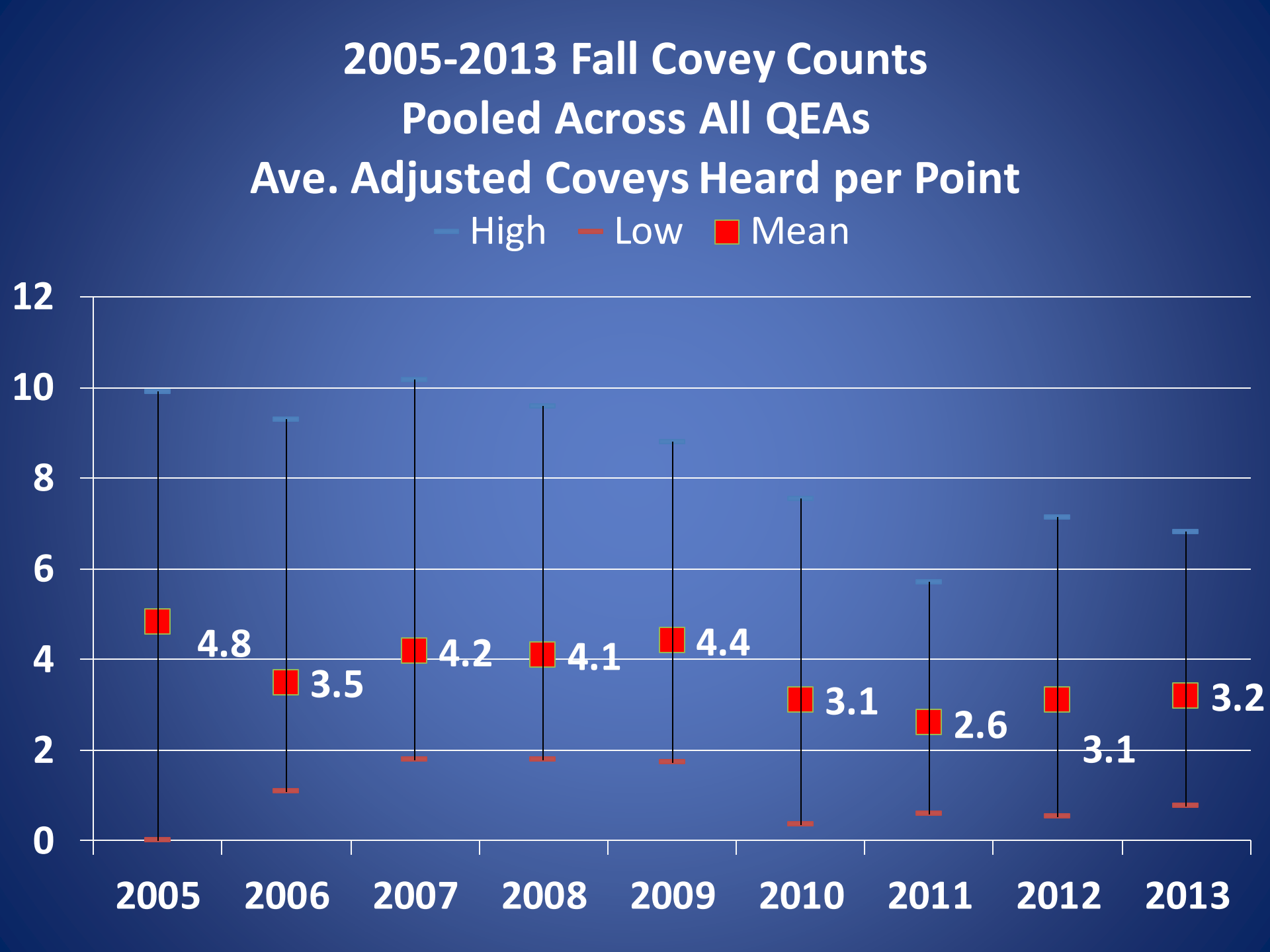
- Quail on public land have been managed with a focus on woody cover and winter food
- Population response lower than expectations
- We began noting superior quail populations on grassland dominated Conservation Areas
- These observations raised many questions and led to a study


ARKANSAS
RAZORBACKS

Statewide Roadside Surveys



2005-2013 Fall Covey Counts
Pooled Across All QEAs
Ave. Adjusted Coveys Heard per Point



Project Description

- We were evaluating quail production on traditionally managed QEA's vs. Grasslands over a 5-year period.

- Traditional Sites – QEA's
  - Robert E. Talbot CA – 4360 ac
  - Shawnee Trail CA – 3635 ac
  - Bois D'arc CA – 3172 ac (only researched last 2 years)

- Grassland Sites
  - Wade and June Shelton Memorial Prairie – 320 ac
  - Stony Point Prairie – 1280 ac
  - Wah Kon Tah Prairie – 3030 ac (added 2nd year)

Methods

- 60 Bobwhite quail were collared at each site annually in Feb/March
- Quail were tracked daily from April through Sept.
  - Nests were monitored for success/failure
  - Habitat use was recorded for each encounter of both adults and broods

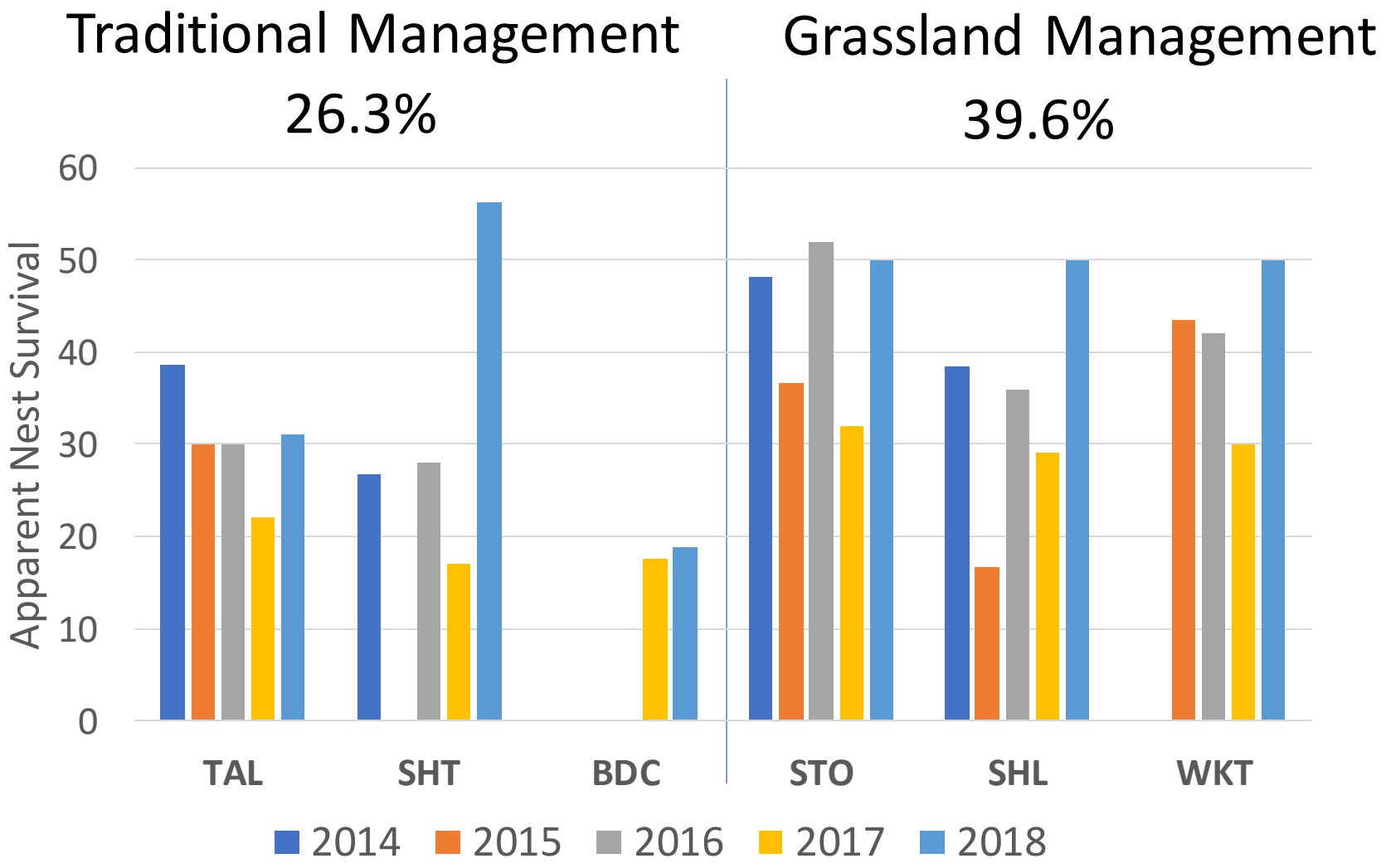
Data Set

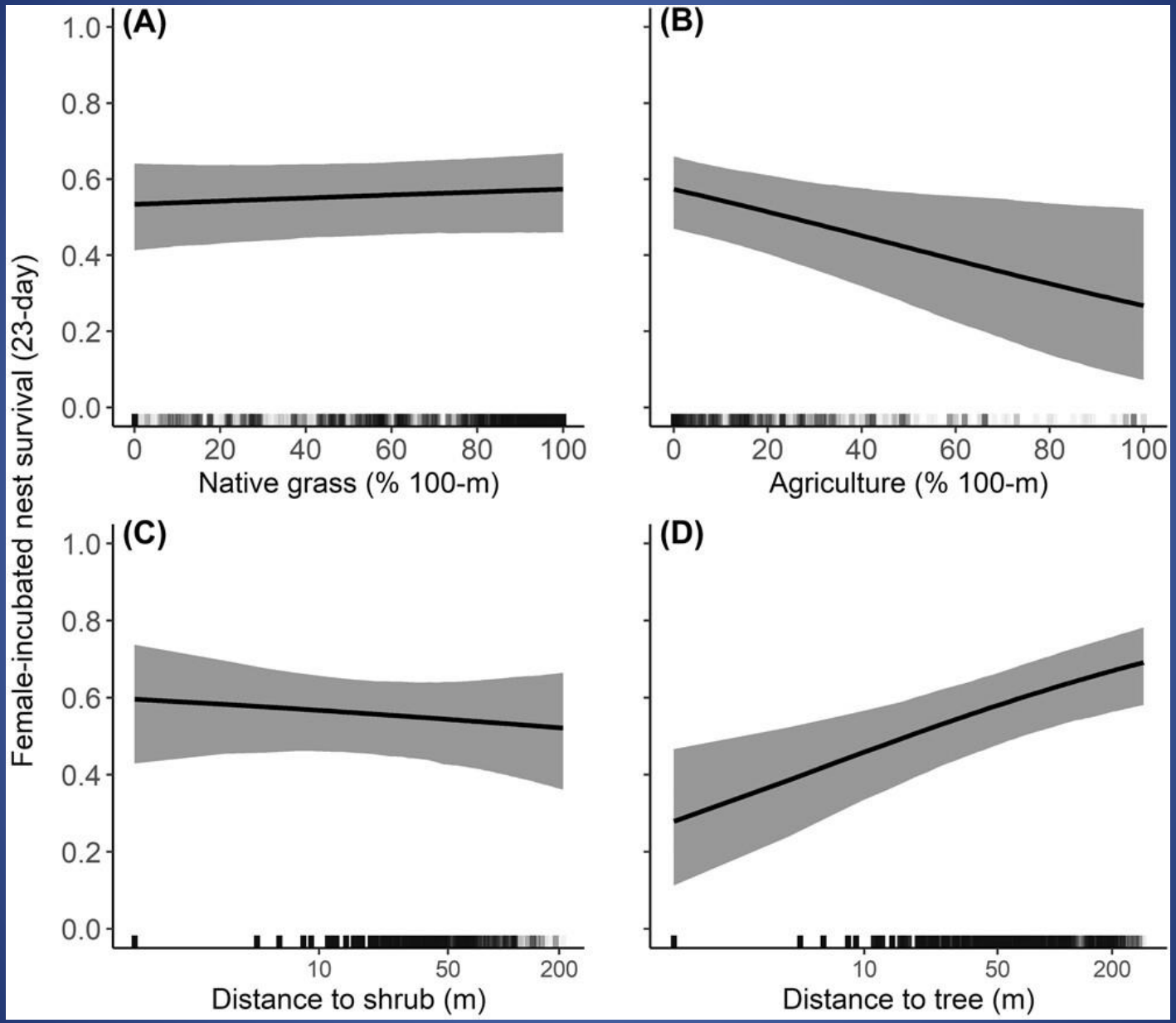
- Over 1500 birds radio collared
- Over 500 nests monitored
- This amounts to the single largest radio-telemetry quail study ever completed in Missouri

2014-2018 Nesting

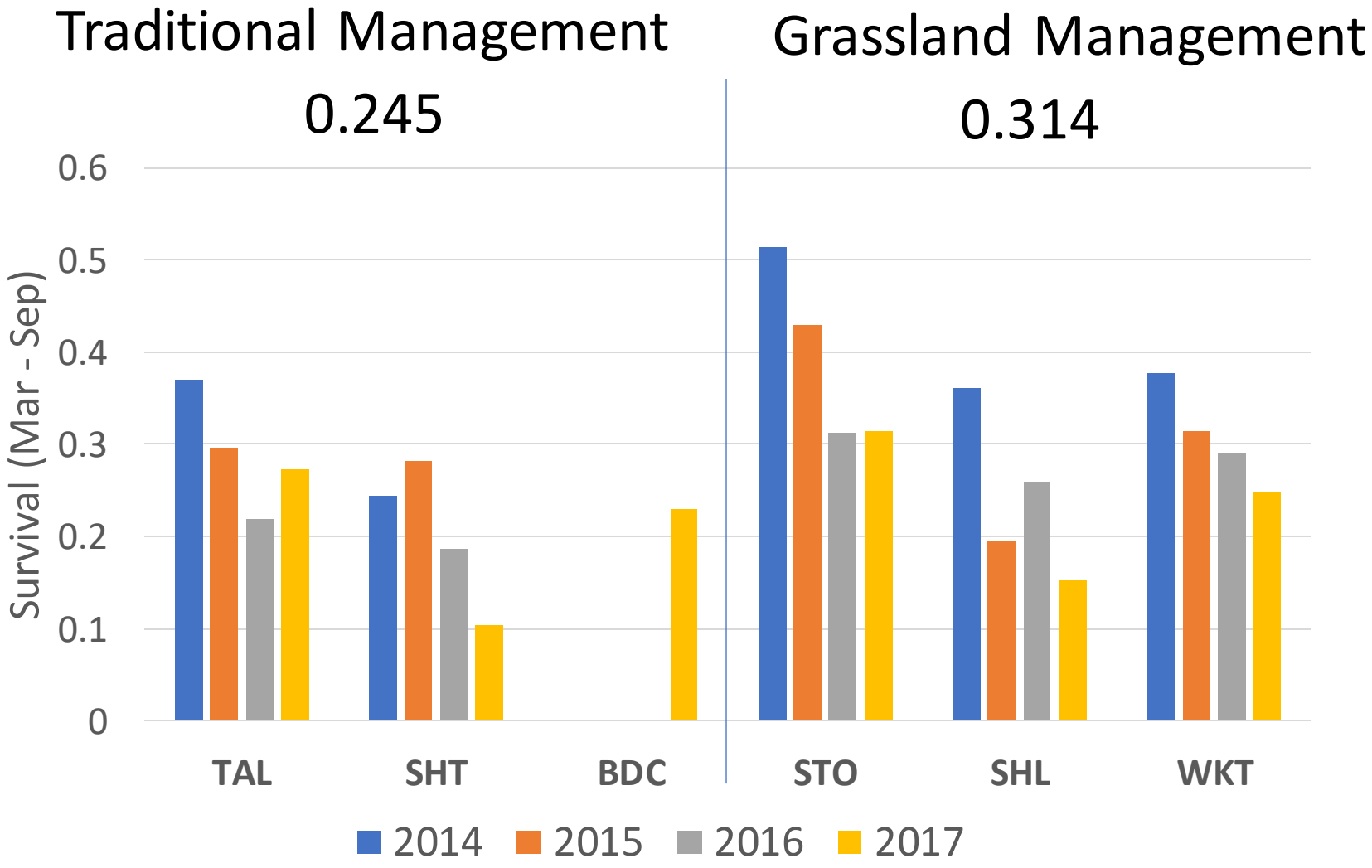
	Total Nests Incubated	Hatched	% Success
Bois D'arc – 2017-2018 - traditional	33	6	18%
Robert E. Talbot - traditional	104	32	31%
Shawnee Trail - traditional	66	22	33%
Shelton Prairie - grassland	78	25	32%
Stony Point Prairie - grassland	148	65	44%
Wah'Kon Tah Prairie – 2015-2018 - grass	89	38	43%

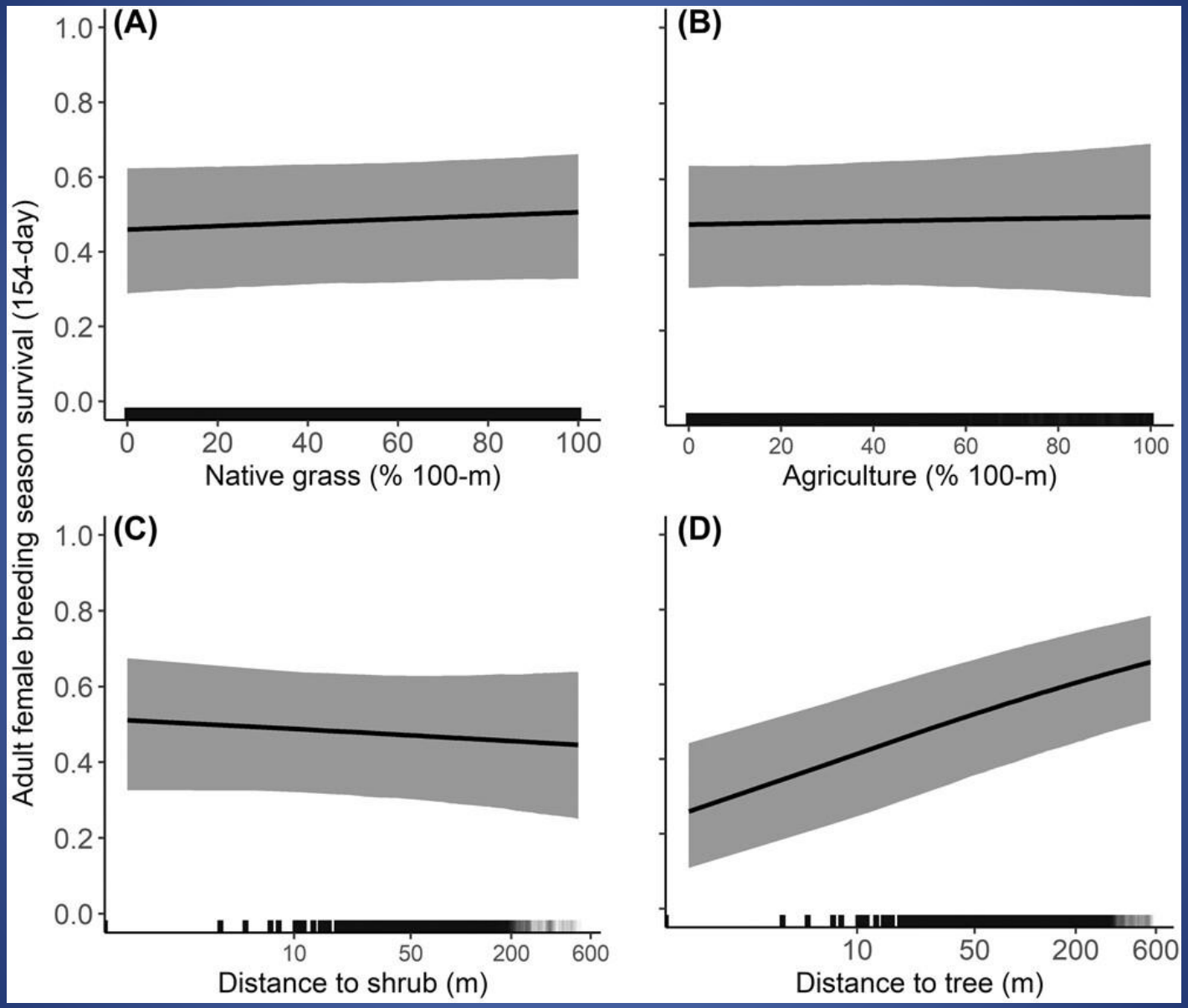
Results: Nest Survival (2014 – 2018)

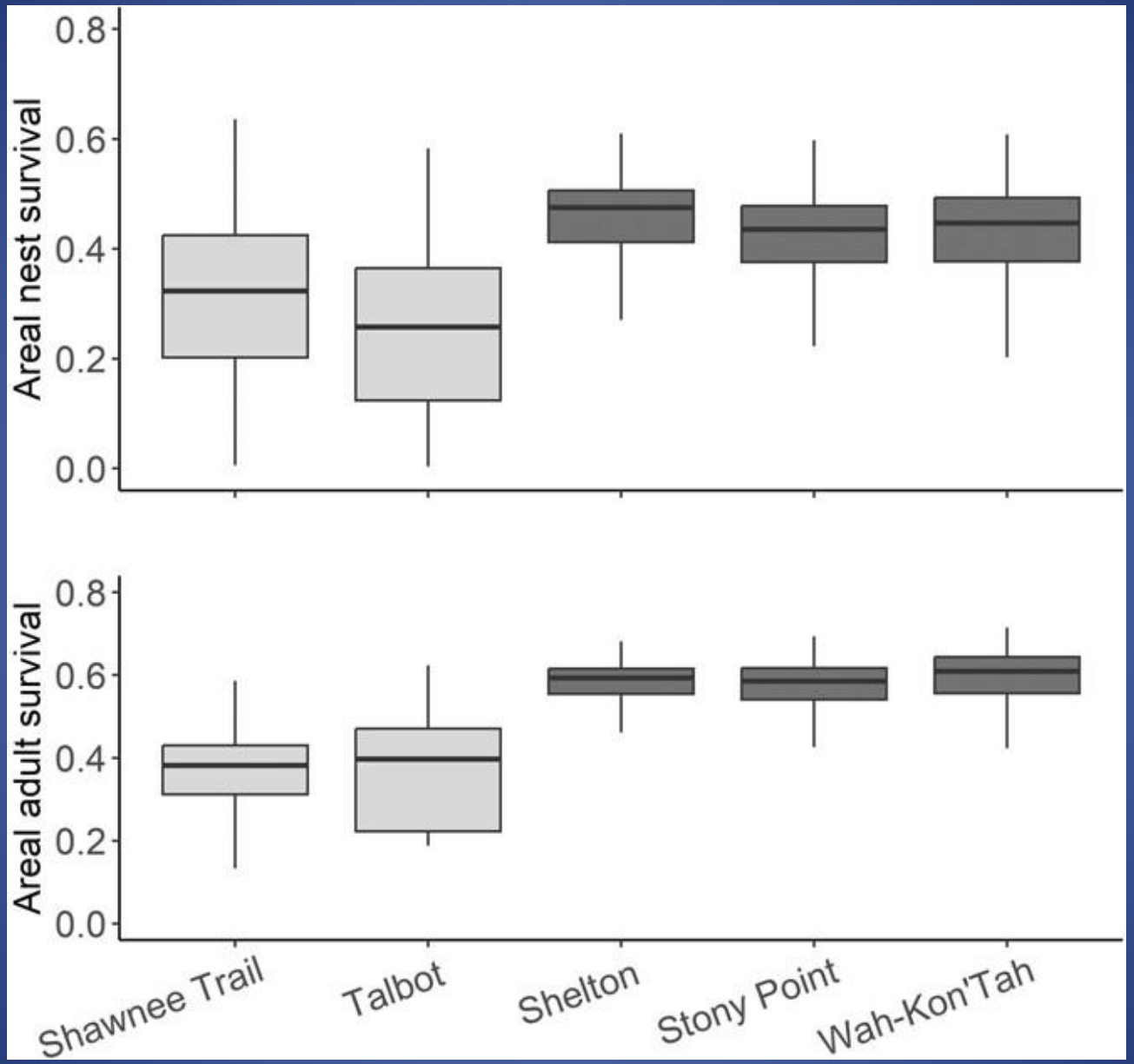



(A)
(B)
(C)
(D)
Female-incubated nest survival (23-day)
1.0
0.8
0.6
0.4
0.2
0.0
0
20
40
60
80
100
Native grass (% 100-m)
Agriculture (% 100-m)
10
50
200
Distance to shrub (m)
Distance to tree (m)

Results: Mar – Sep Survival (2014 – 2017)




(A)
(B)
(C)
(D)
Adult female breeding season survival (154-day)
1.0
0.8
0.6
0.4
0.2
0.0
0
20
40
60
80
100
Native grass (% 100-m)
Agriculture (% 100-m)
10
50
200
600
Distance to shrub (m)
Distance to tree (m)


Areal nest survival
0.8
0.6
0.4
0.2
0.0
Areal adult survival
0.8
0.6
0.4
0.2
0.0
Shawnee Trail
Talbot
Shelton
Stony Point
Wah-Kon'Tah

Grasslands Are Better

- Grasslands were superior for both nest success and adult survival
- The key here is usable space; grasslands maximize usable space
  - The fragmented nature of traditional management leads to higher nest predation

- The number 1 factor in determining where birds would be found was time since disturbance
  - Anything beyond 12 months since disturbance received minimal use

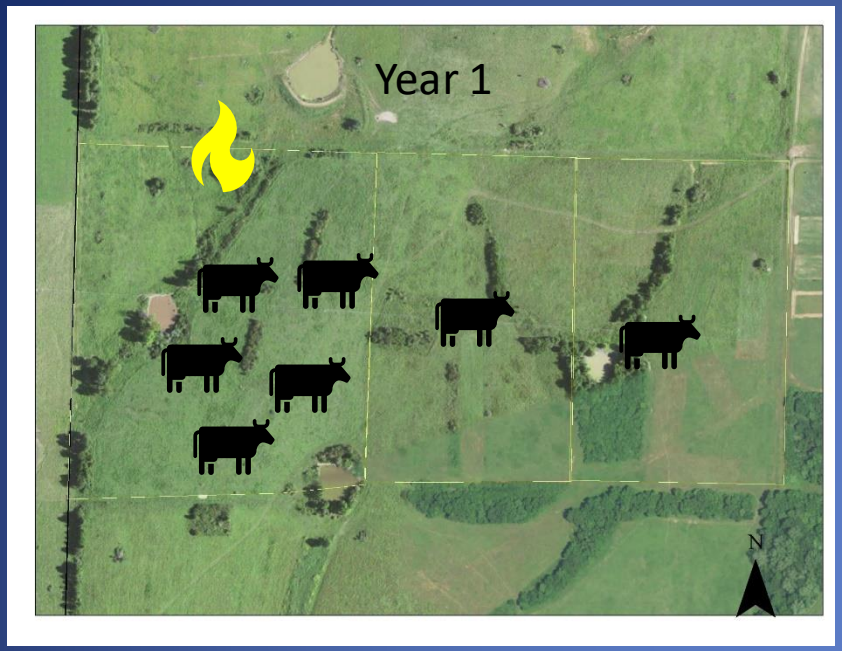
Why?

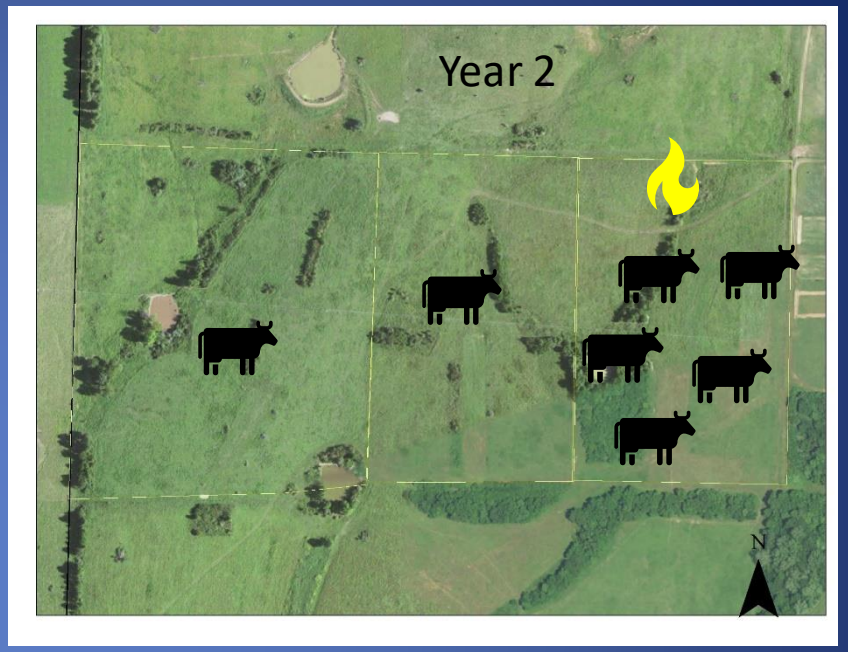
- We receive 45+ inches of rain in MO
  - Vegetation too thick
  - Chicks can't navigate through thick cover
- Birds not only had more success nesting and raising broods in disturbed areas, but they SELECTED those disturbed areas disproportionate to their availability
  - Birds likely select disturbed areas to nest, so they didn't need to relocate for brood rearing

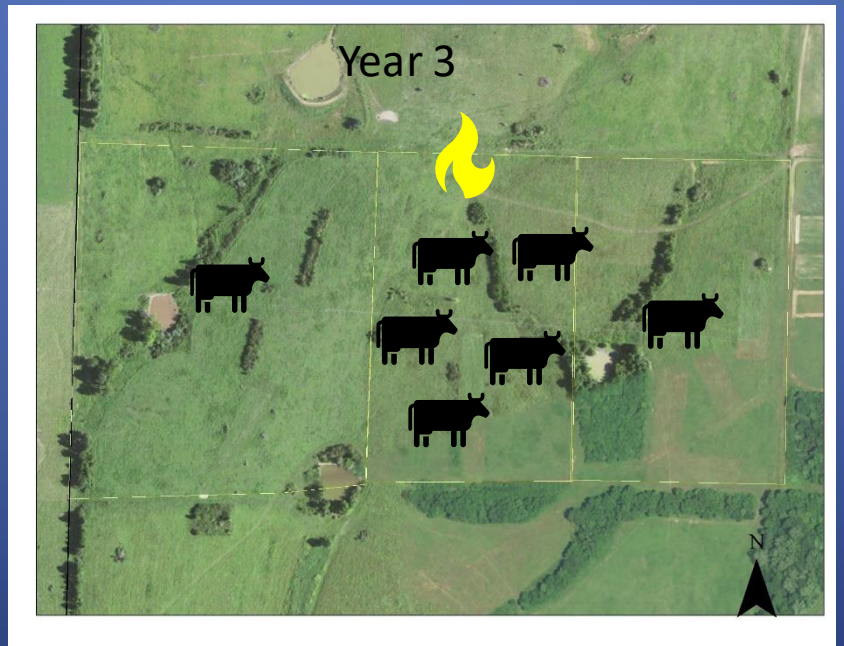
Grazing Details

- Patch-burn Grazing
  - Burn 1/3 of the pasture, but stock cattle based on total acr
  - Utilize st lbs of cattle, usually f 120 days)
  - Previous showed cattle yi

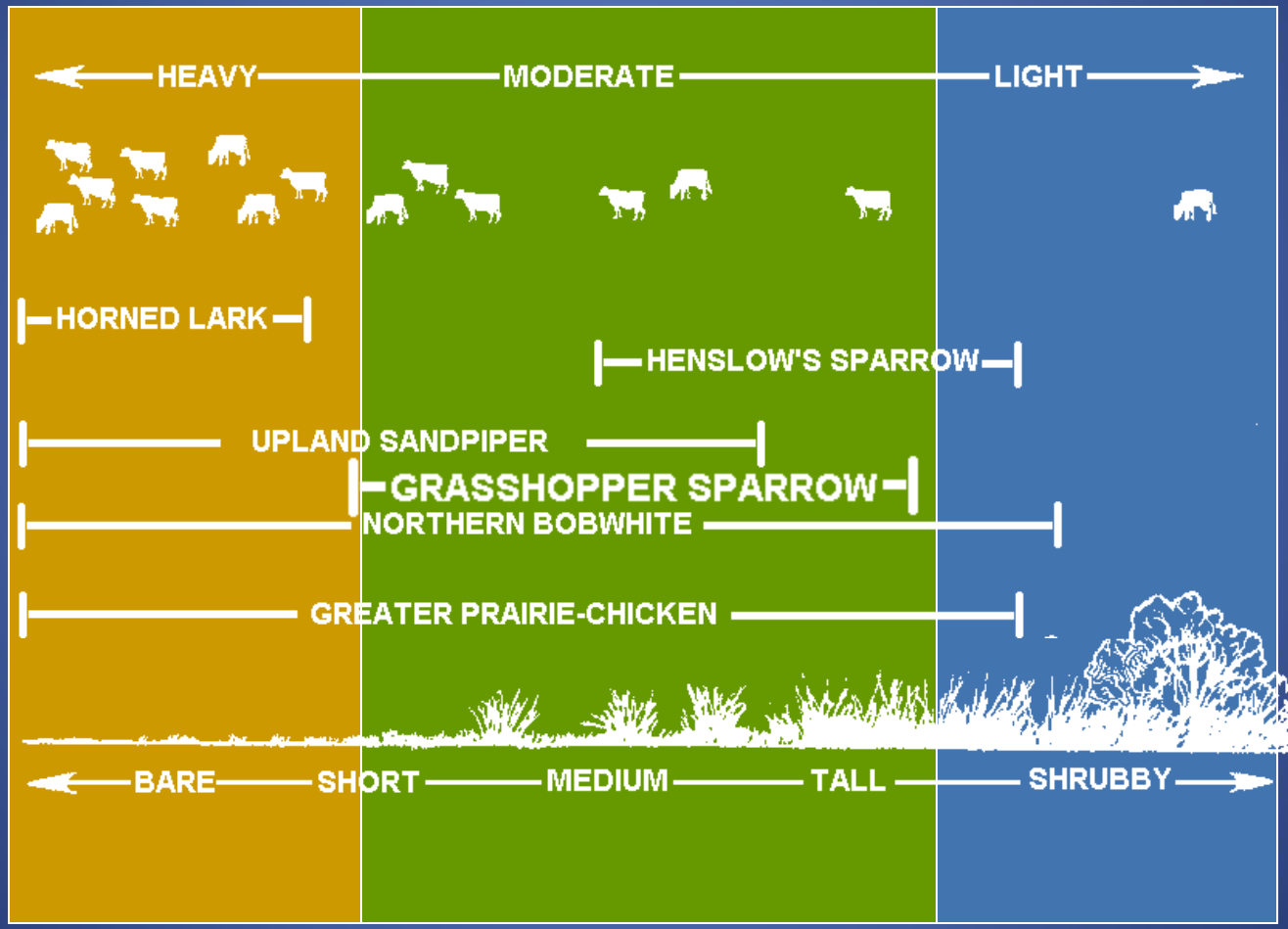
Patch-Burn Grazing



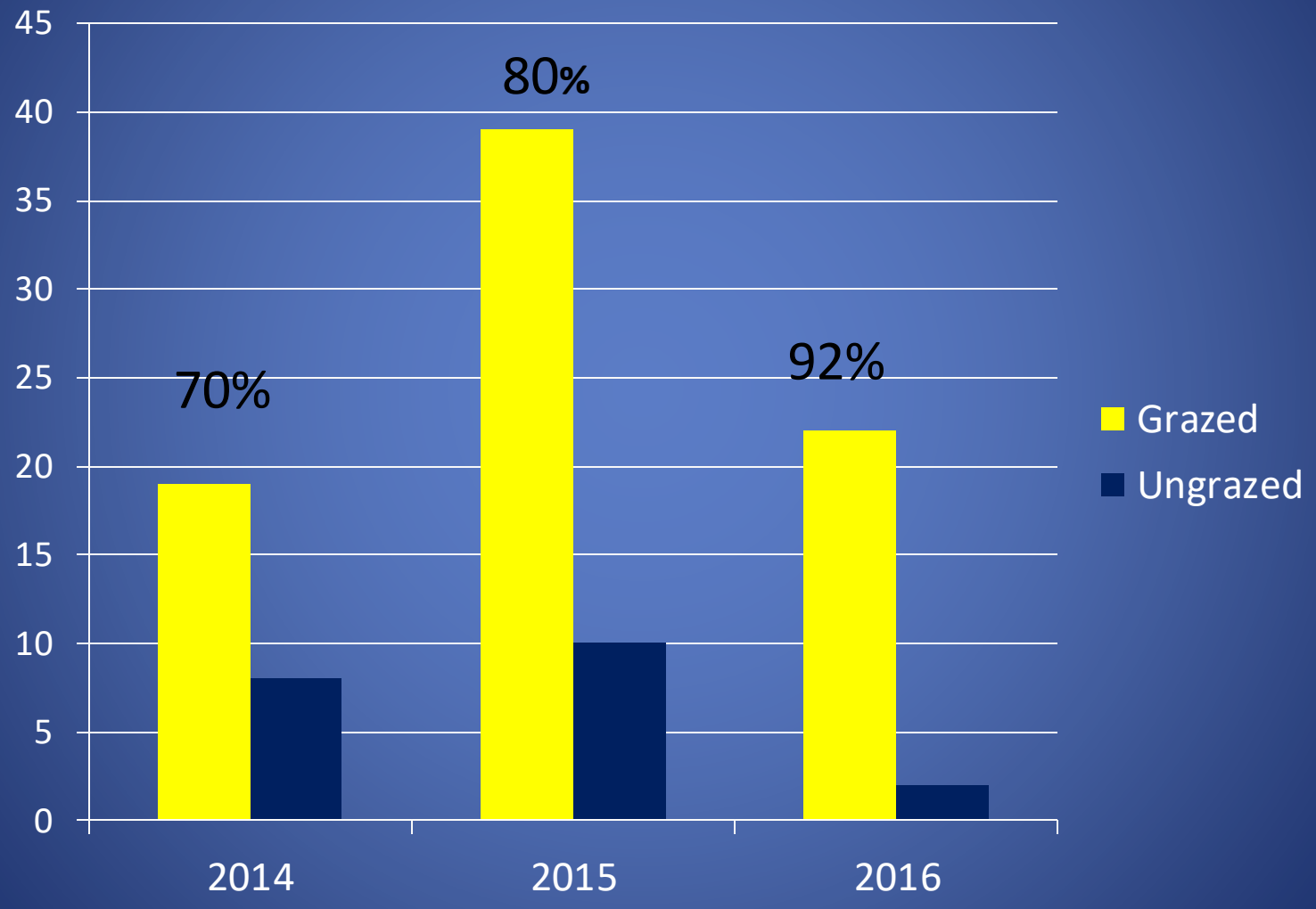




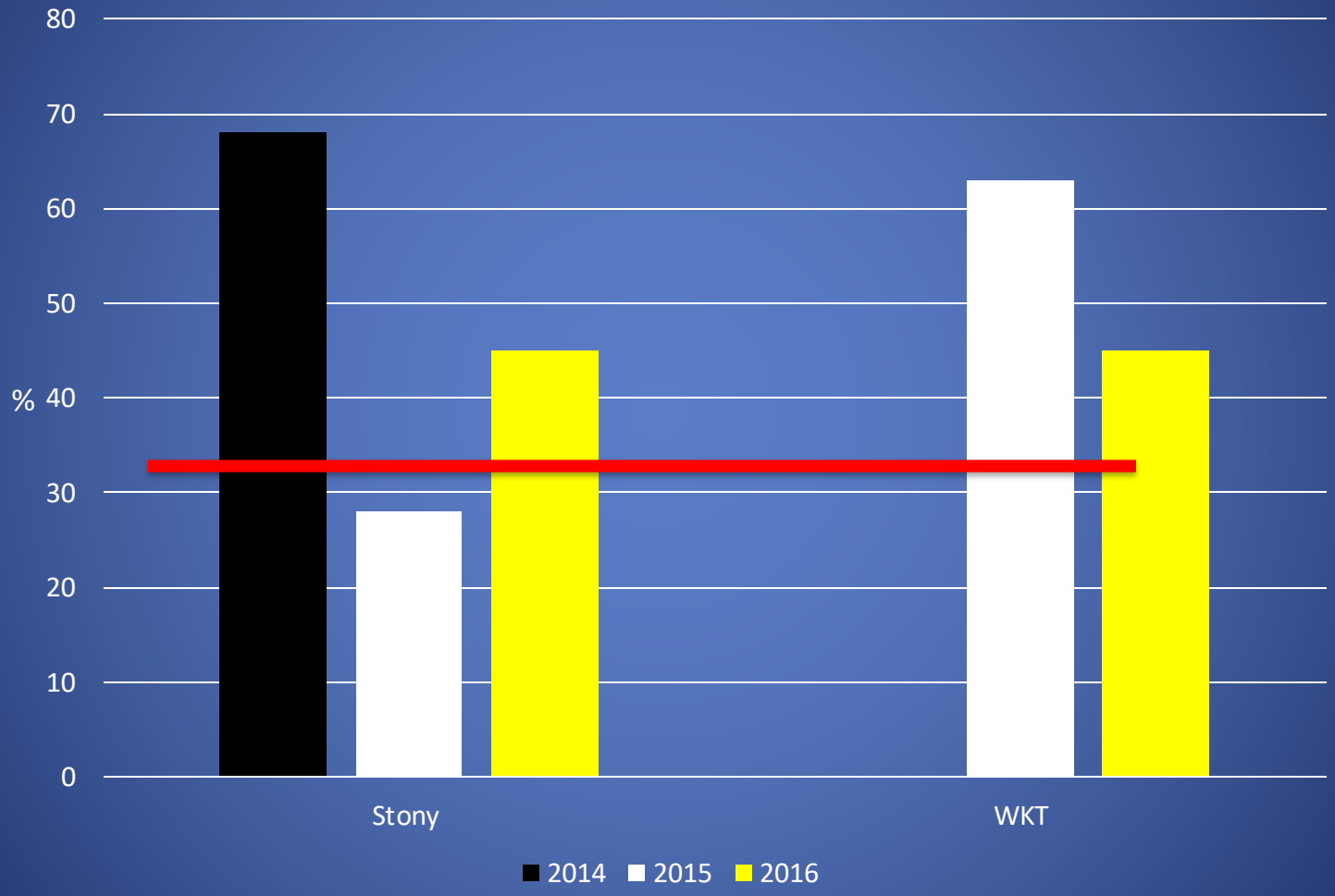
Why Grazing?
Proper Grazing Creates a Variety of Structure

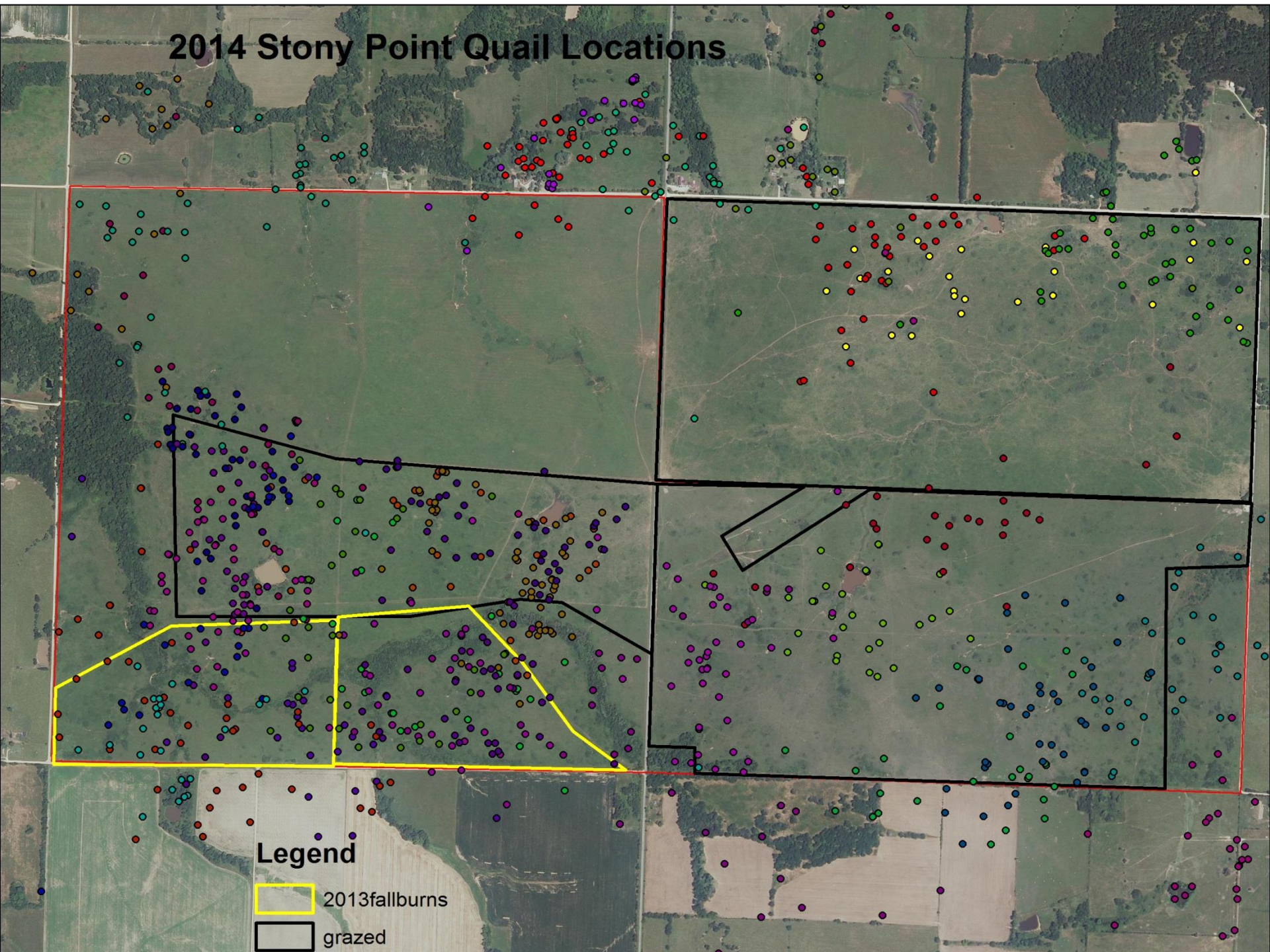


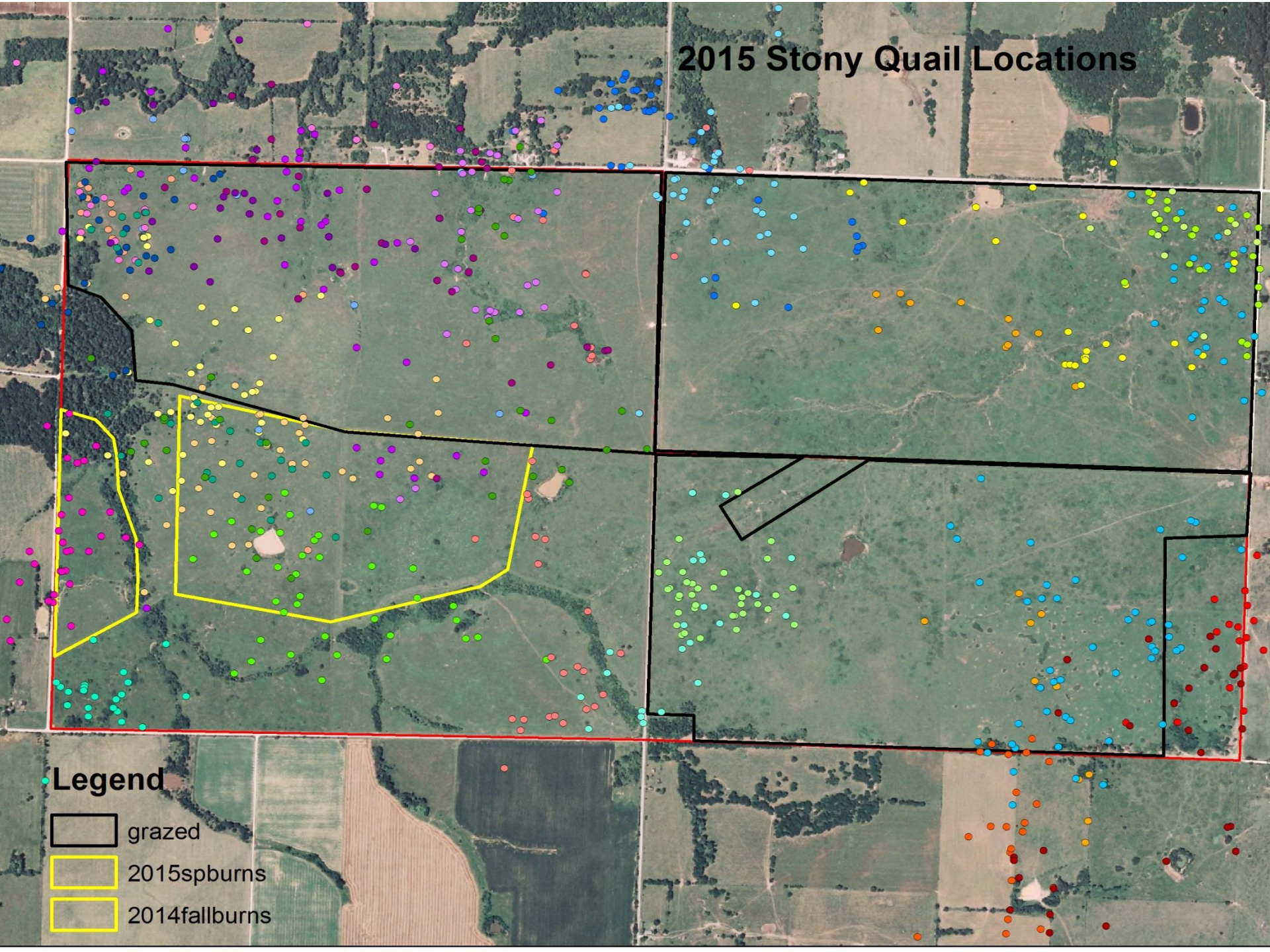
Number of Nests Per Habitat Type on Stony Point Prairie (60-75% area grazed)



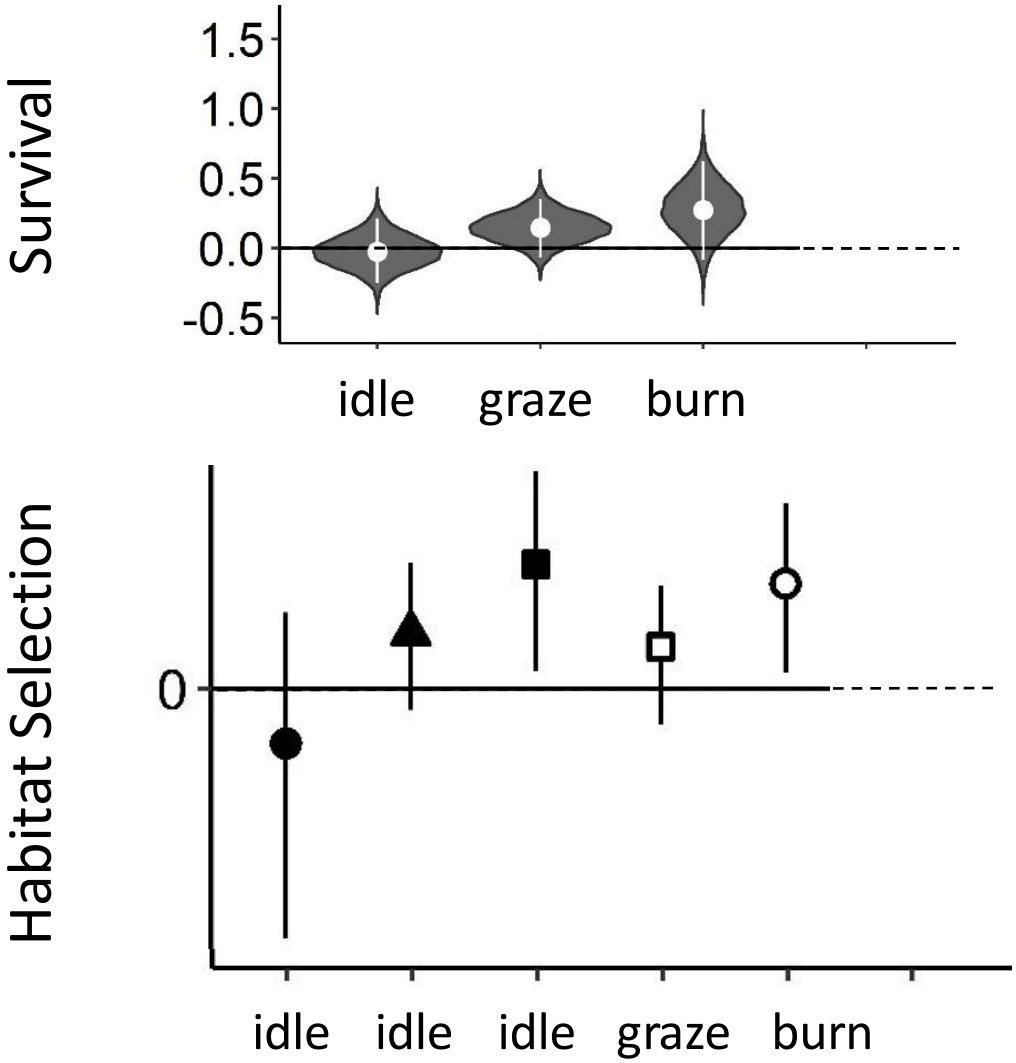
Nest Success in Grazed Units




2014 Stony Point Quail Locations
Legend
2013fallburns
grazed


2015 Stony Quail Locations
Legend
grazed
2015spburns
2014fallburns

Survival and selection increased with grazing and burning

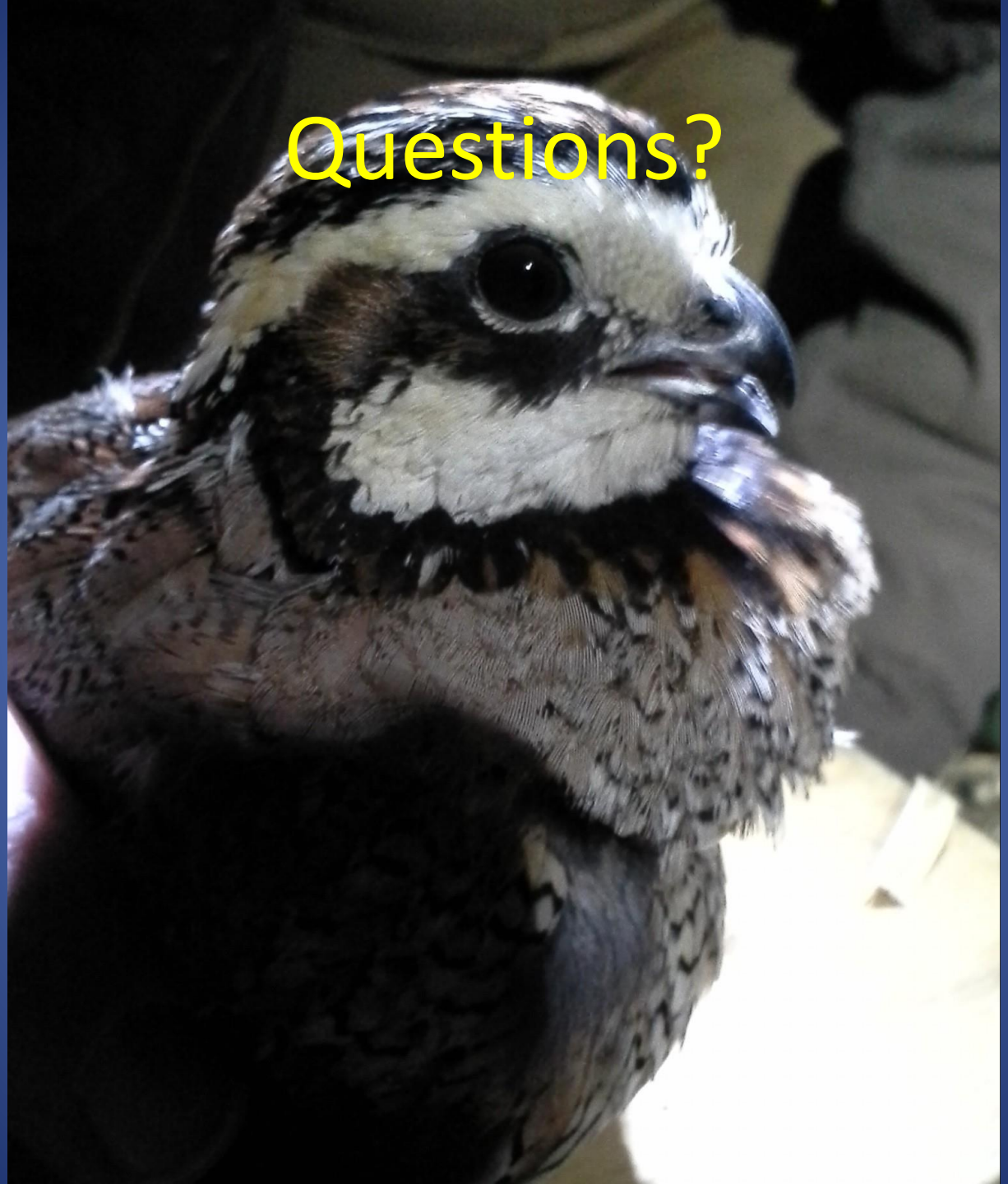


Disturbance

- Birds readily used burned units and grazed units, both adults and broods
- Why not just use fire?
  - Need at least ½ the area available for nesting.
  - Finite amount of burn days
- Grazing maximizes usable space across the entire area

Summary

- Grasslands are superior for producing more quail than traditionally managed sites EVERY year
- Grazed areas preferentially selected by adults and broods.
- Not only can grazing and quail production coexist, conservation grazing appears necessary to increase overall quail numbers in grasslands.


Questions?