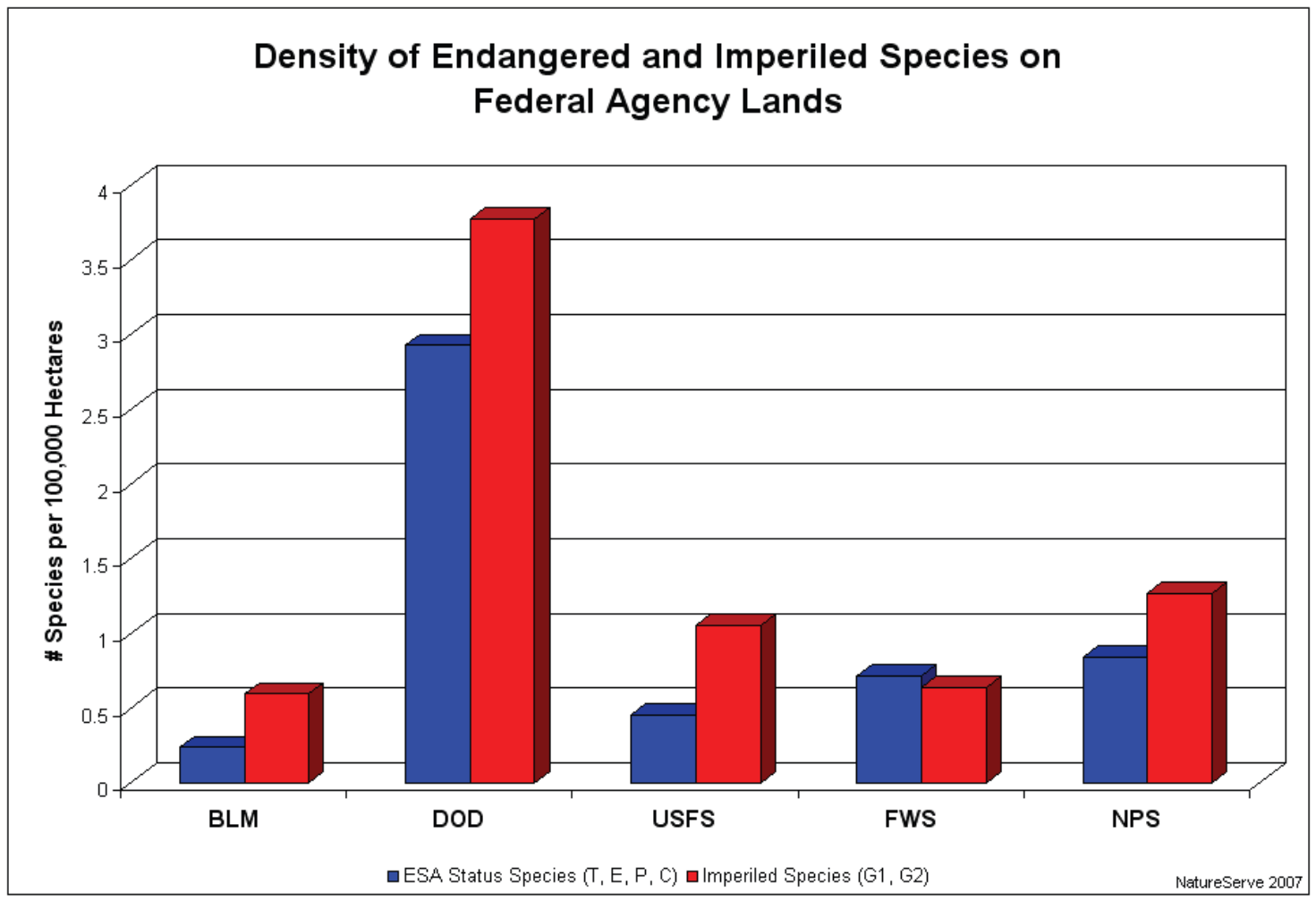
Integration of ESDs into endangered species management: The golden-cheeked warbler

Understory thinning as a tool

- Modification of wildfire behavior
- Promote recruitment of fire tolerant species
- Decrease impacts of insects and diseases
- Maintenance of open stand wildlife habitat
- Military tra

DOD lands as wildlife refuges



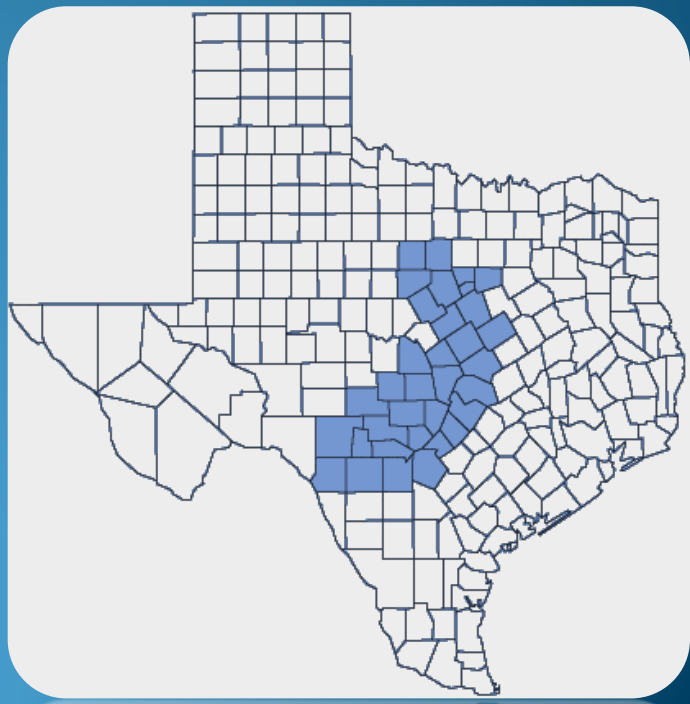
"[This] highlights the disproportionate role that DOD lands play in sustaining the nation's biodiversity."—Stein et al. 2008 (Bioscience)

Fort Hood

- ≈40,000 soldiers
- Golden-cheeked Warbler
- Black-capped Vireo
- Fort Hood must balance
  - Training capability and flexibility
  - Environmental stewardship

Golden-cheeked Warbler

- Migratory songbird
- Endangered—1990 (Emergency Listing)
- Habitat—mature juniper/oak woodland
- Ashe juniper for nesting material
- Oak spp important for foraging



Dismounted Infantry Maneuvers

- Creation of maneuver lanes
- Line of sight
- Realistic environmental context

All of this is thinned!

Objectives

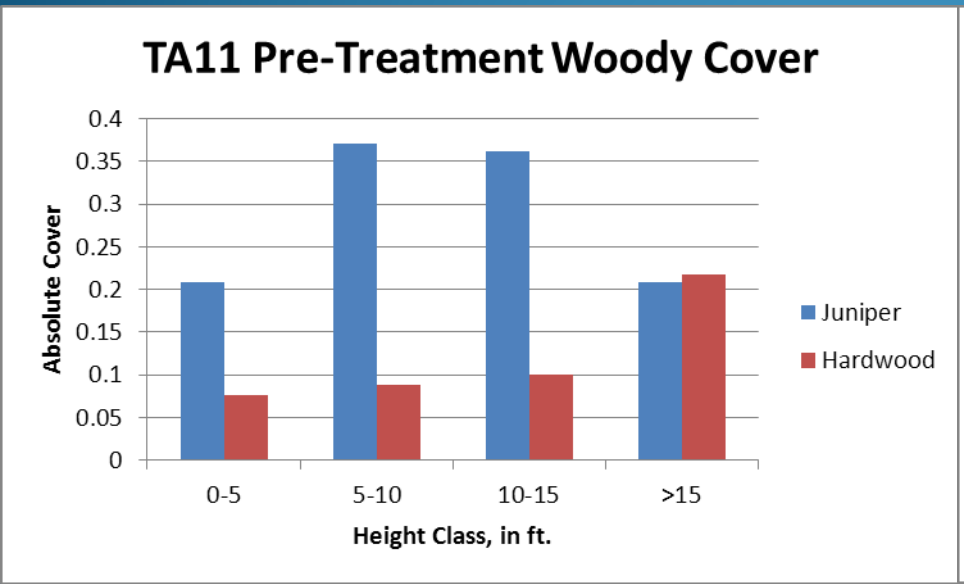
- Quantify differences in GCWA……
  - Abundance
  - Reproductive success
  - Behavior

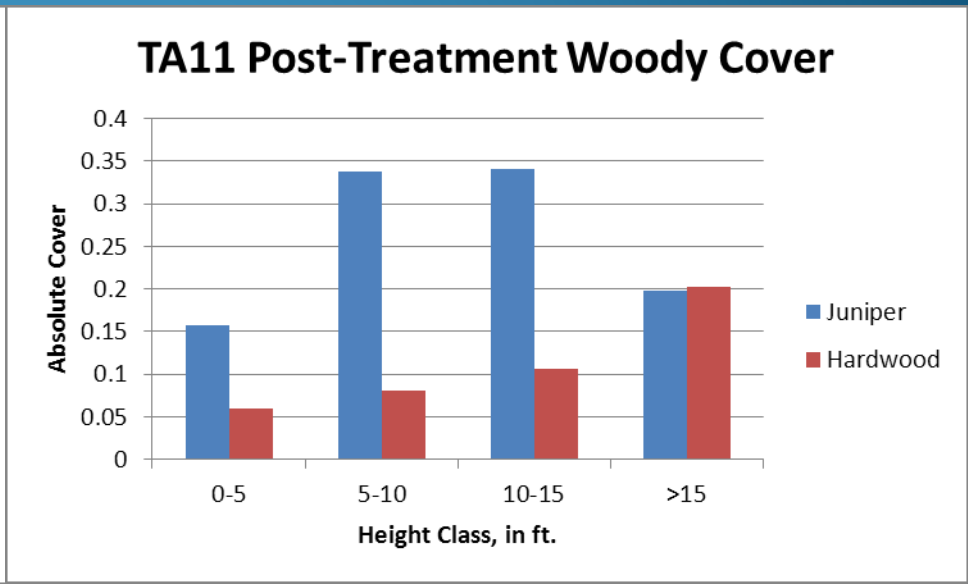
Methods

- Understory thinning
  - Some hand cutting
  - Bobcat with skid steer
  - Mulching
- Vegetation surveys
- Territory mapping
- Territory monitoring

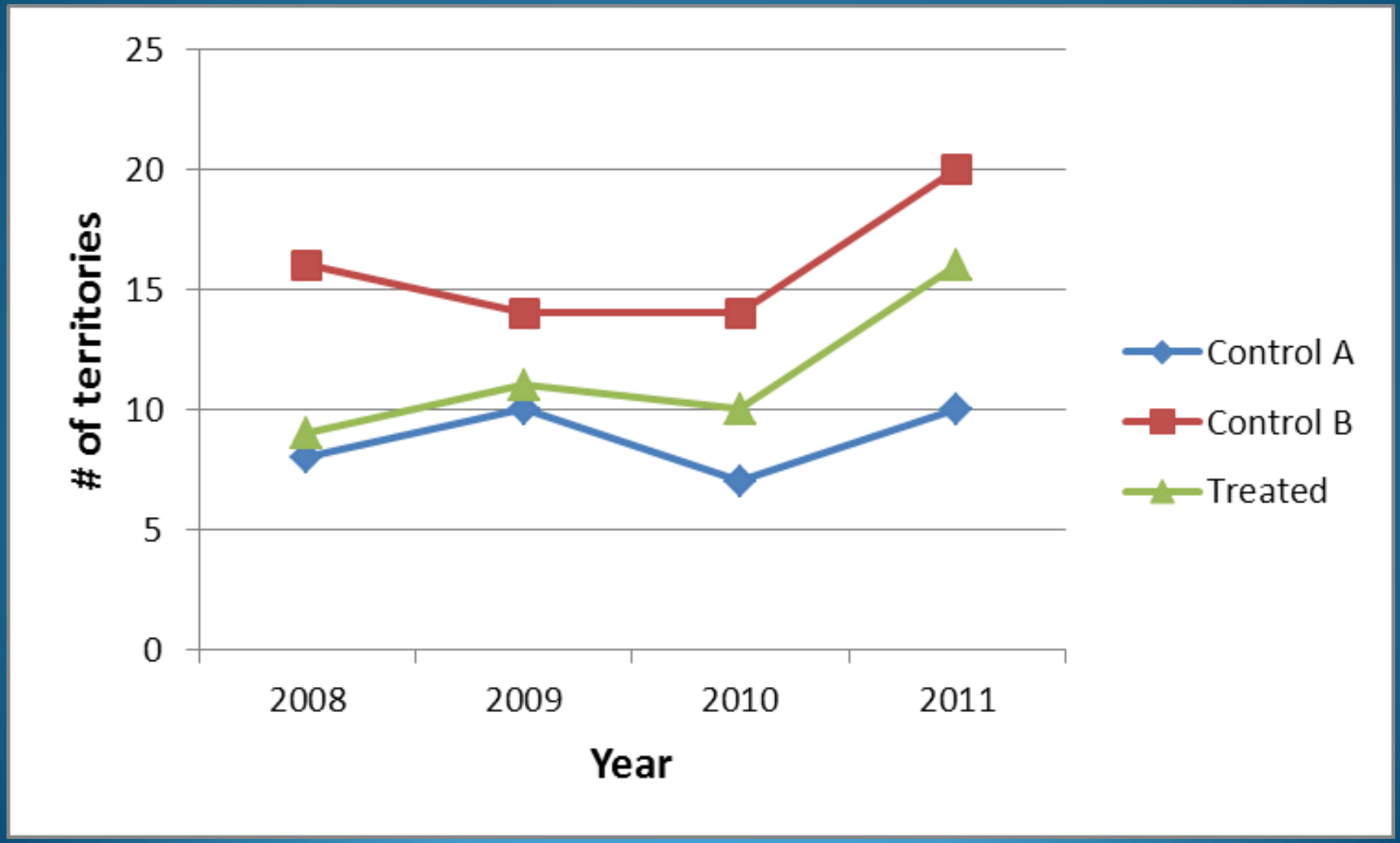
Results: vegetation

- 0-5 ft- 5% juniper removed
- 5-10 ft- 3% juniper removed
- 10-15 ft- 2% juniper removed
- 15 + ft- 1% juniper removed

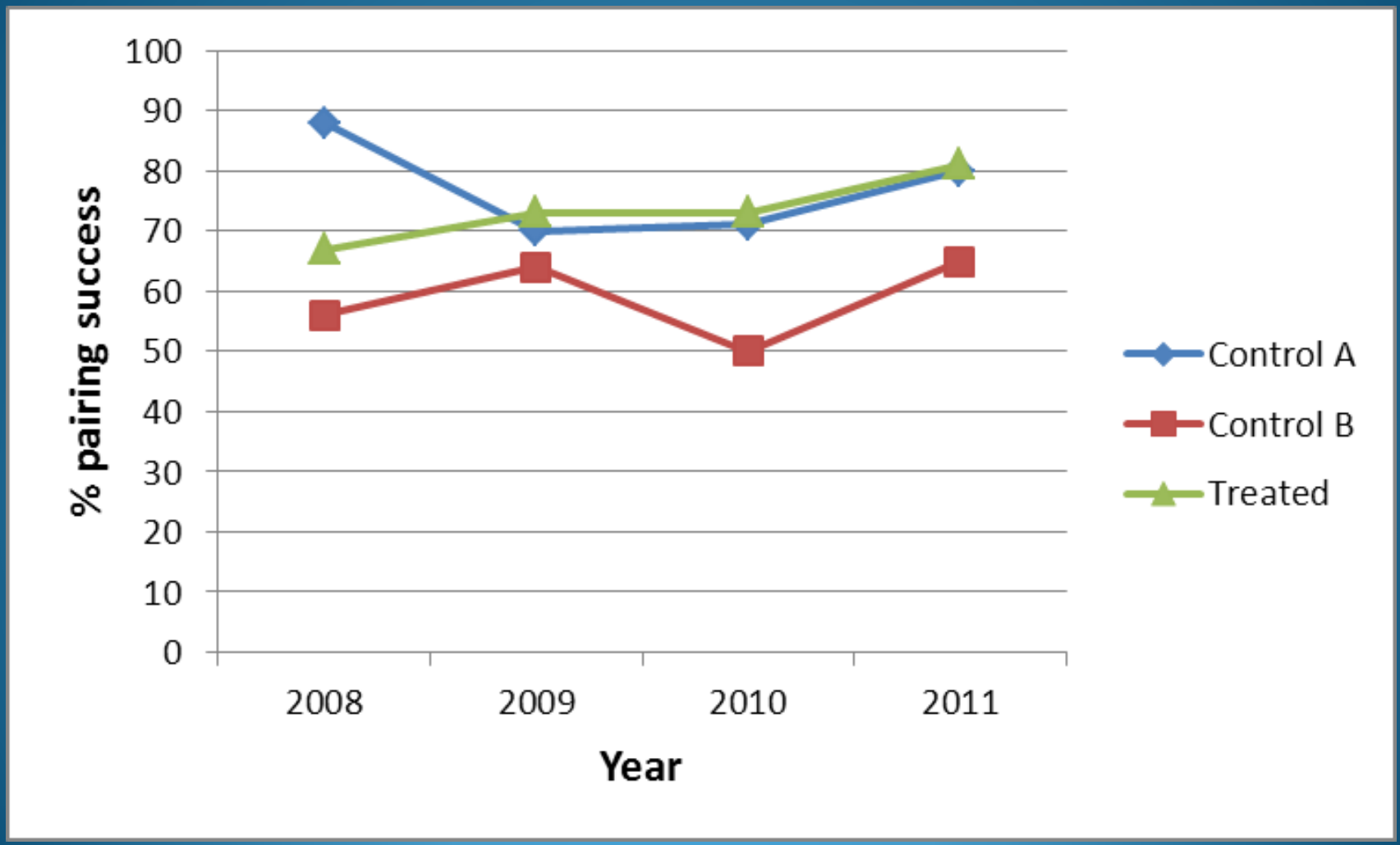




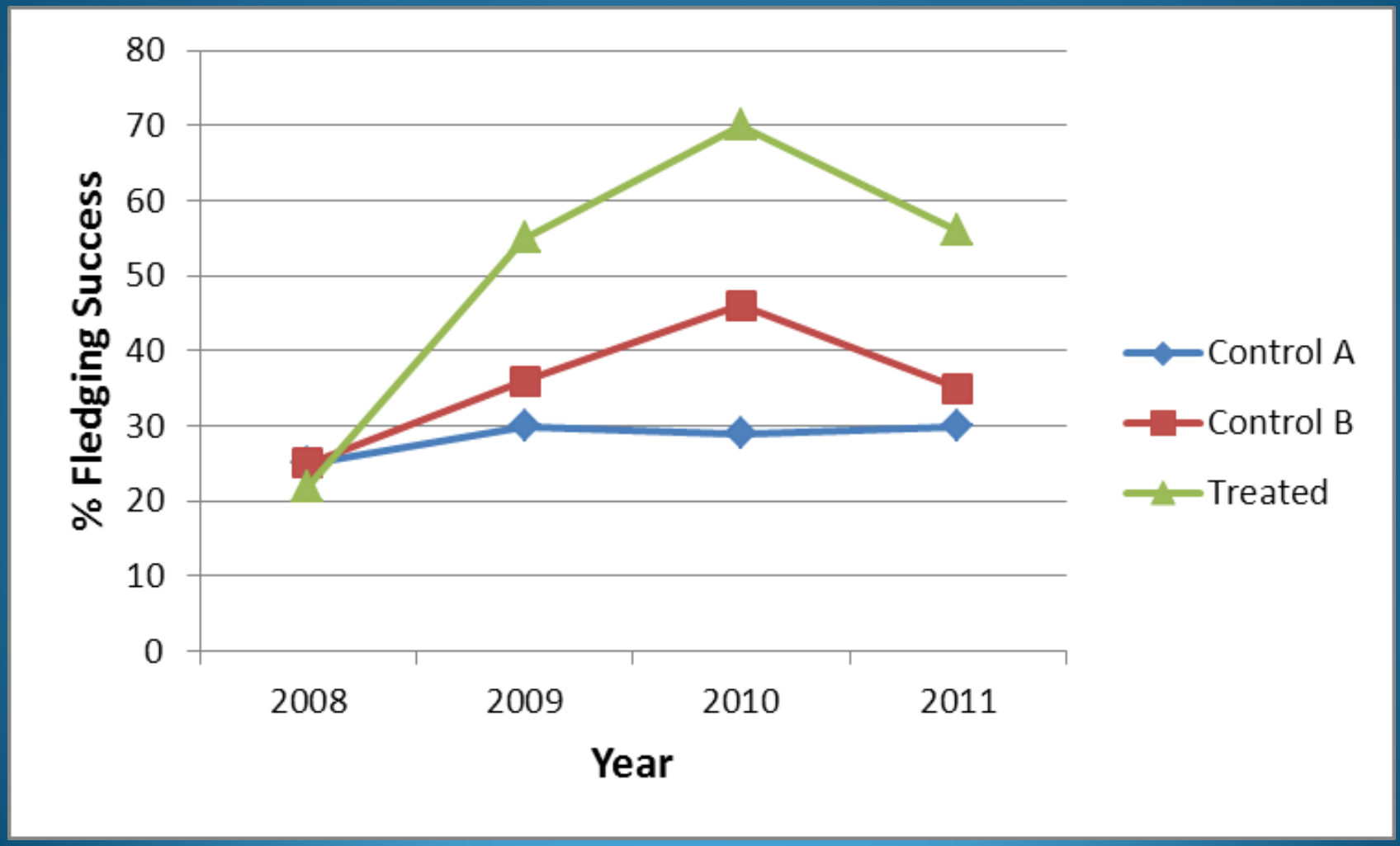
Results: abundance



Results: pairing success

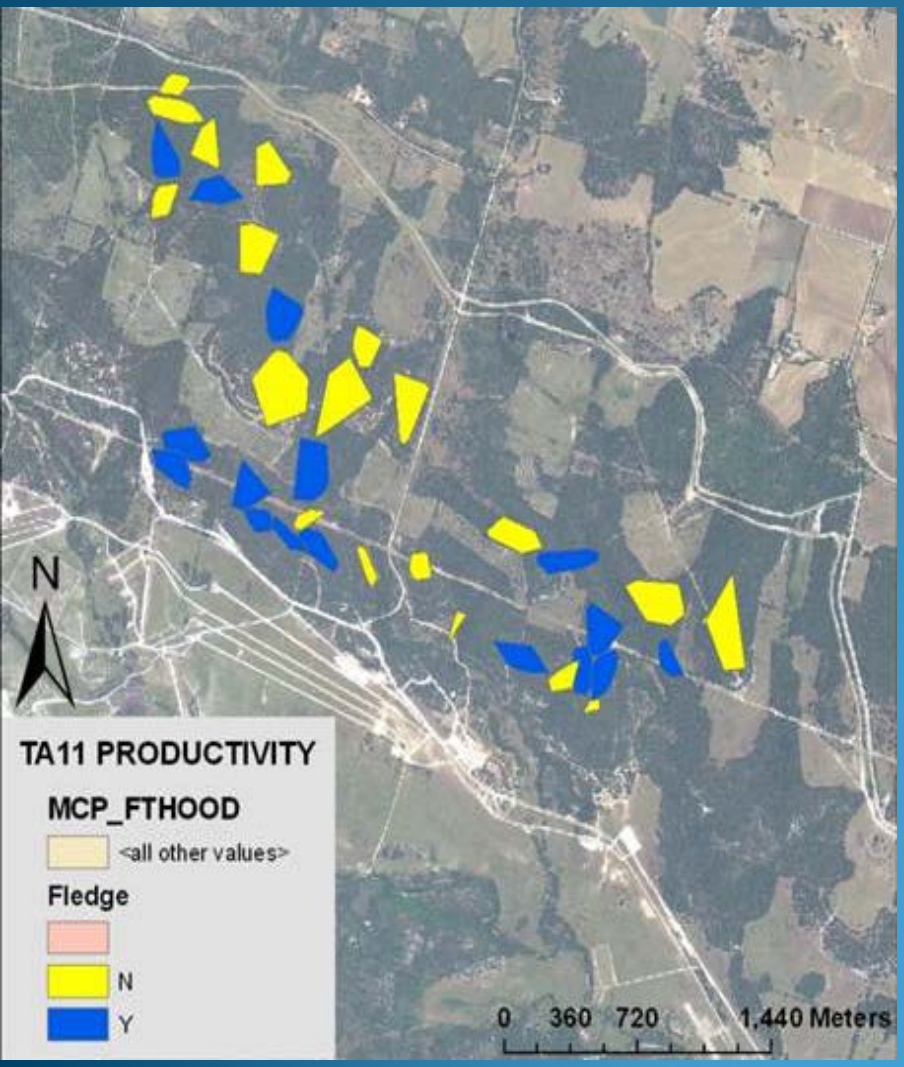


Results: fledging success

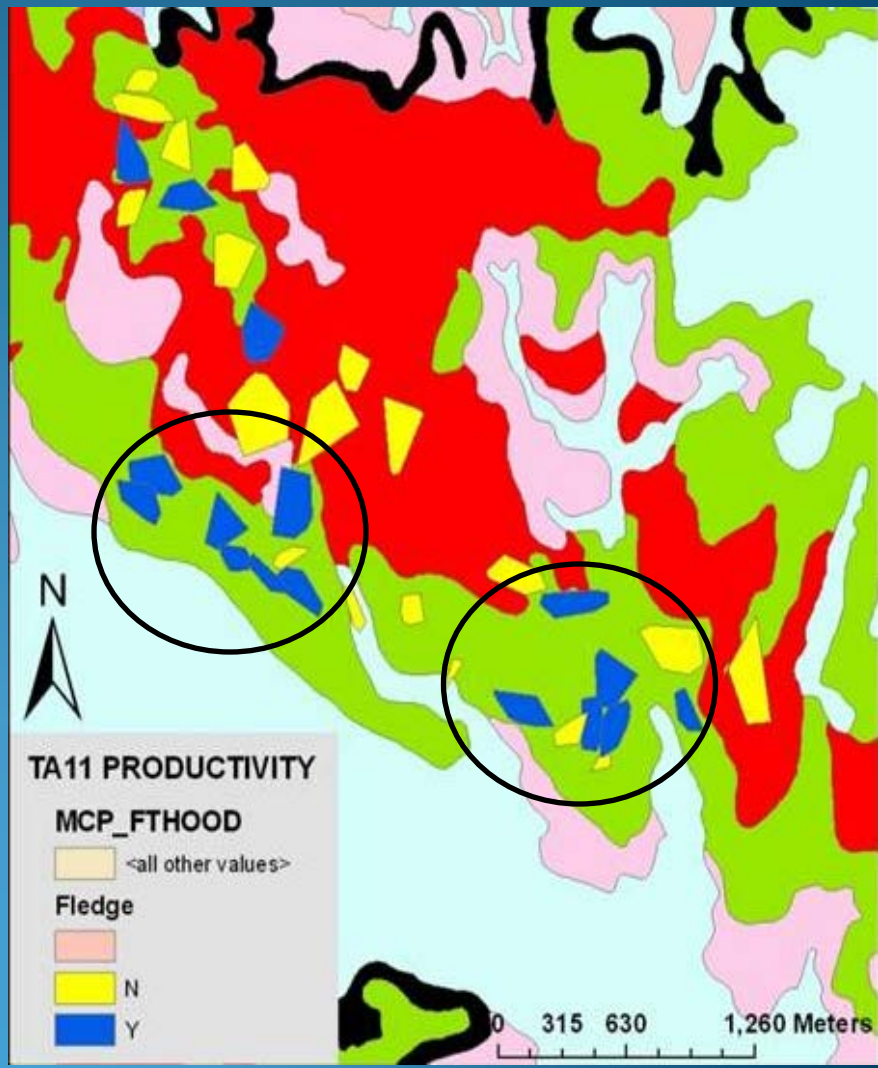


Golden-cheeked Warbler reproductive success is strongly affected by ecological site

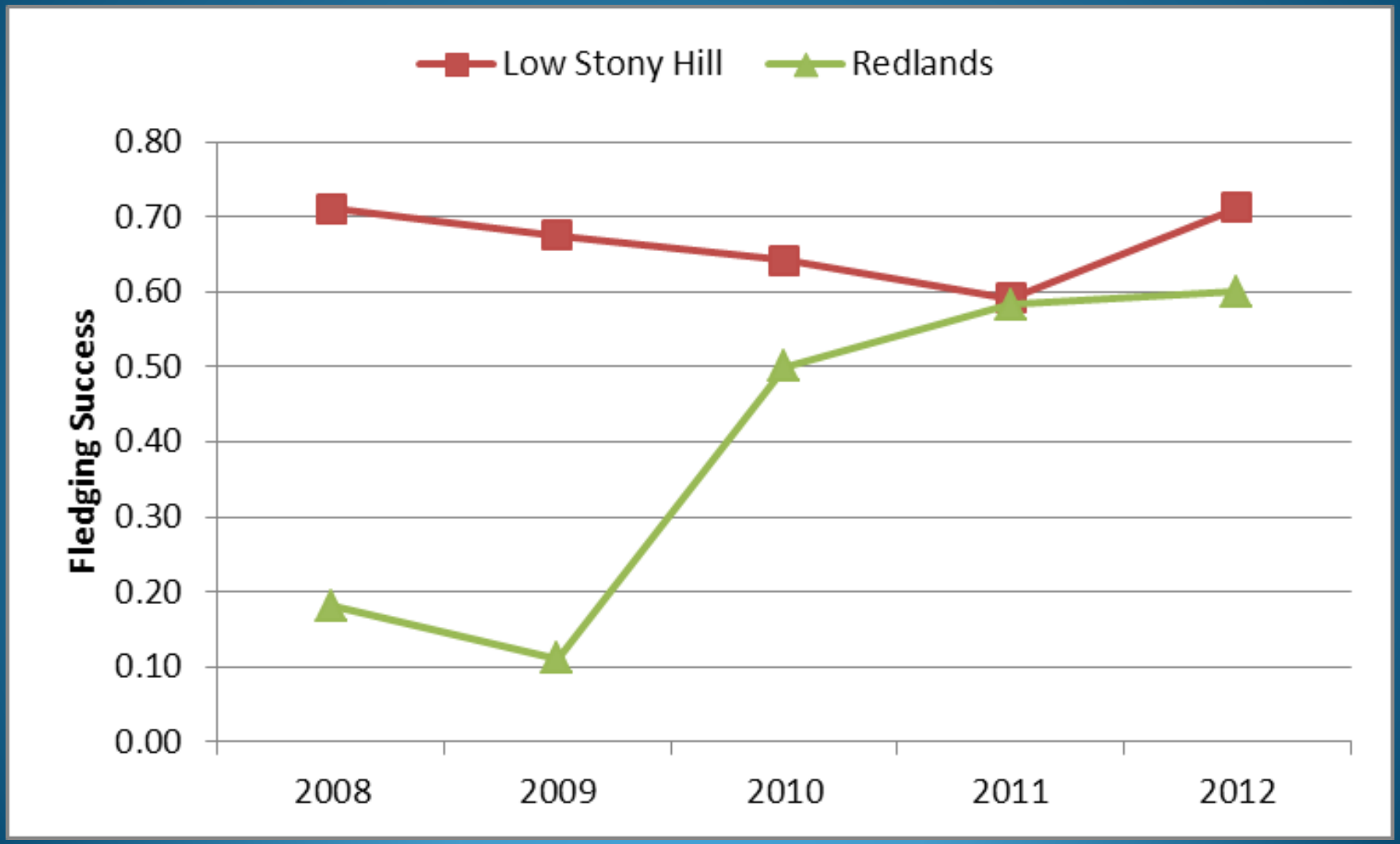
Redlands: reproductive success= 31%



Low Stony Hill: reproductive success= 63%



Ecological Sites (All Impact Sites)



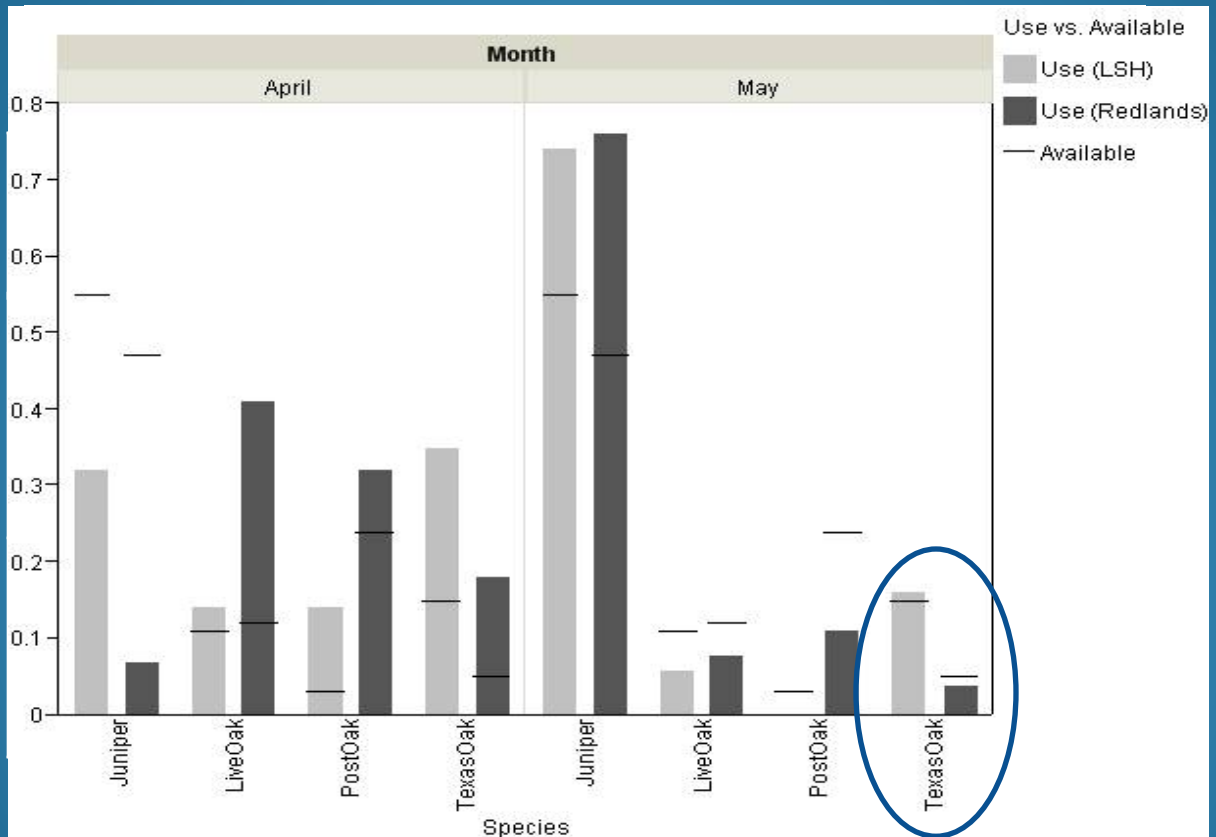
Why would warbler productivity be correlated with ecological sites?

- Mechanistic Context
- Historic Context

Food & Foraging

Low Stony Hill	Ecosite	Redlands
	Tree Species Composition	
High	Reproductive Success	Low
High	Food Availability	Low
Low	Foraging Effort	High

- LSH= Texas Oak; Redlands= Post Oak
- Fledging success: LSH>>Redlands
- More caterpillars on Texas oak vs Post oak
- Use vs Available differences & Increased movement rate in Redlands



Warbler Habitat: a historical perspective

- Likely limited to canyons, slopes, and mesas
- Juniper in the bottomlands was suppressed by fire
- Fire suppression + Heavy grazing has lead to increased density of juniper
- How much juniper does a GCWA really need?
- Is it possible that we have created warbler habitat in areas where it did not exist historically?

What is the reference condition?

Why does this matter for Fort Hood?

- Balance training with land stewardship
- As soldiers return home, demand for training space will increase
- Budget cuts for defense spending
- Base Realignment and Closure (BRAC)
  - 1988, 1991, 1993, 1995, 2005,.....coming soon?
- Thinning opened up >2300 acres of previously unused land for dismounted maneuvers
- Ecological sites as decision support for range planning (i.e. habitat quality)

Take Home Messages

- "Museum" management may not be appropriate
- In fact, it may not be possible
- ESDs can be a great proxy for vegetative composition……
- Thus, ESDs can be a proxy for habitat quality
- Bottom line……

More cross-pollination of wildlife and range sciences!

Acknowledgements

- Michael Morrison
- Institute for Renewable Natural Resources
  - Neal Wilkins, Roel Lopez, and Brian Hays
  - Shannon Farrell and Andrew Campomizzi
- Steve Manning, Justin Tatum, and Curtis Hodges
- Integrated Training Area and Management (US Army)
- Office of the Secretary of Defense
- Grad students and field technicians

U.S.ARMY

TEXAS A&M AGRILIFE EXTENSION

DEPARTMENT OF DEFENSE