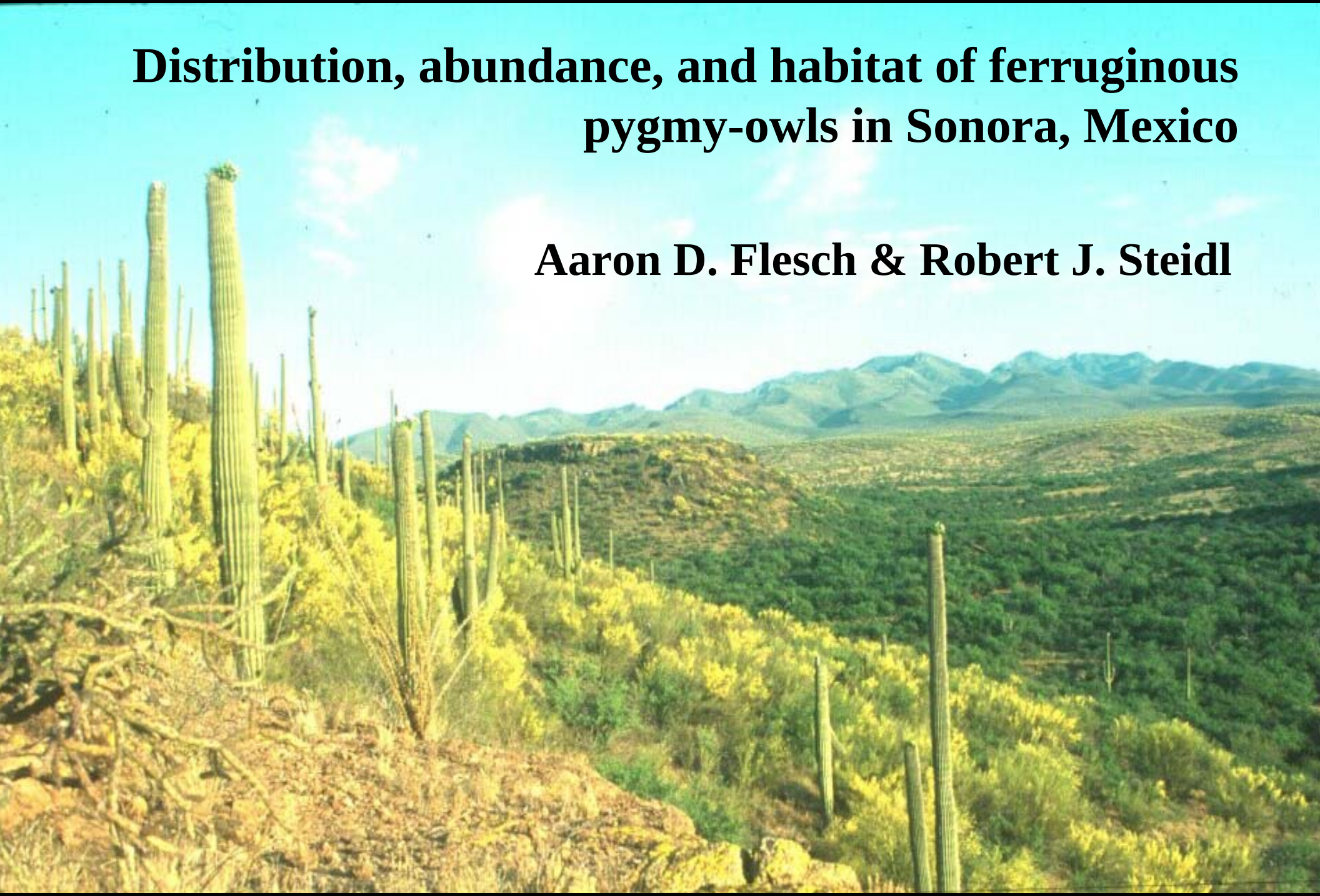
Distribution, abundance, and habitat of ferruginous pygmy-owls in Sonora, Mexico

Aaron D. Flesch & Robert J. Steidl

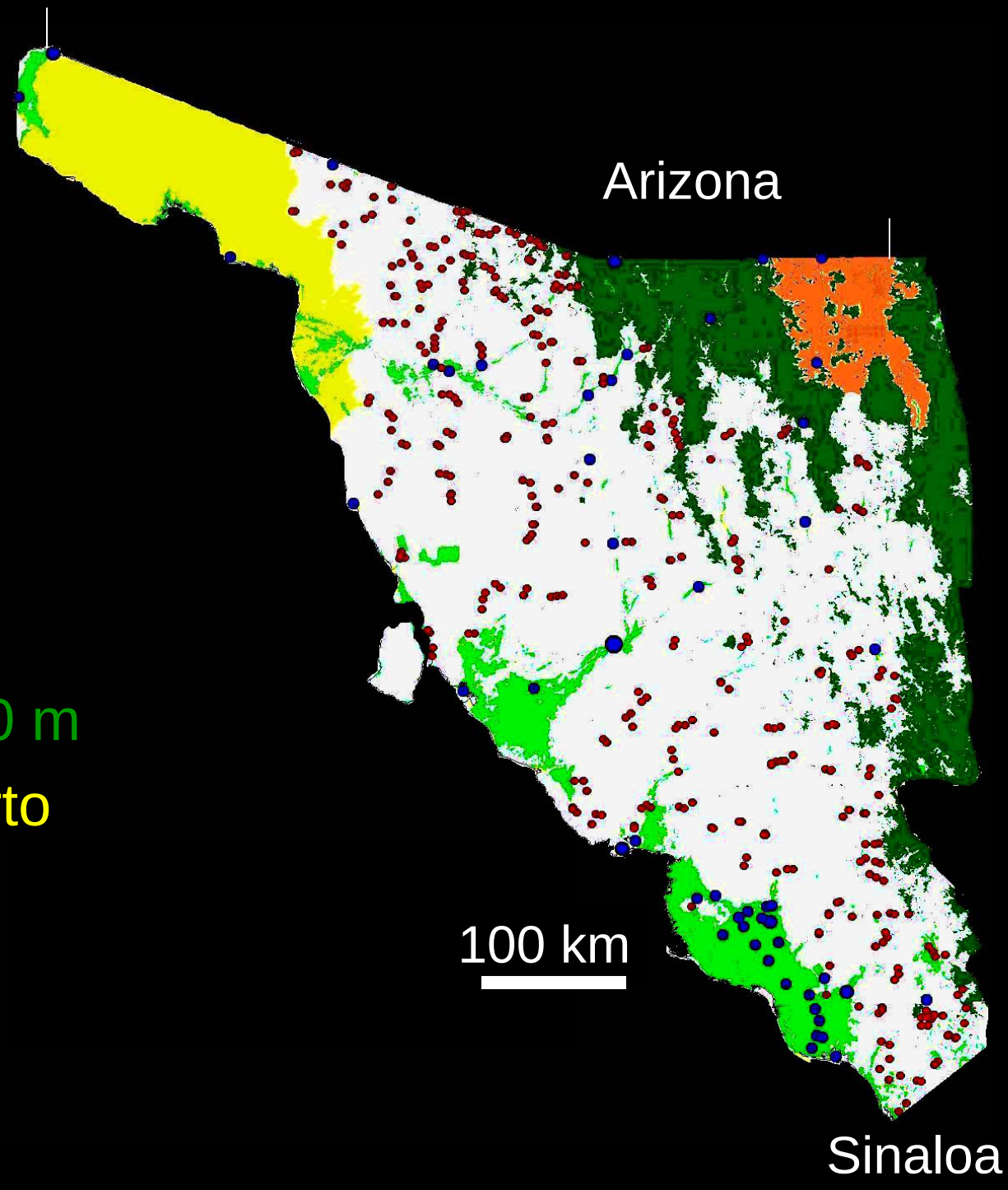


School of Renewable Natural Resources, Univ. of Arizona

Objectives

- Determine distribution in Sonora, Mexico
- Estimate abundance
- Quantify and describe habitat
- Consider implications for recovery in Arizona

Study Area



Excluded

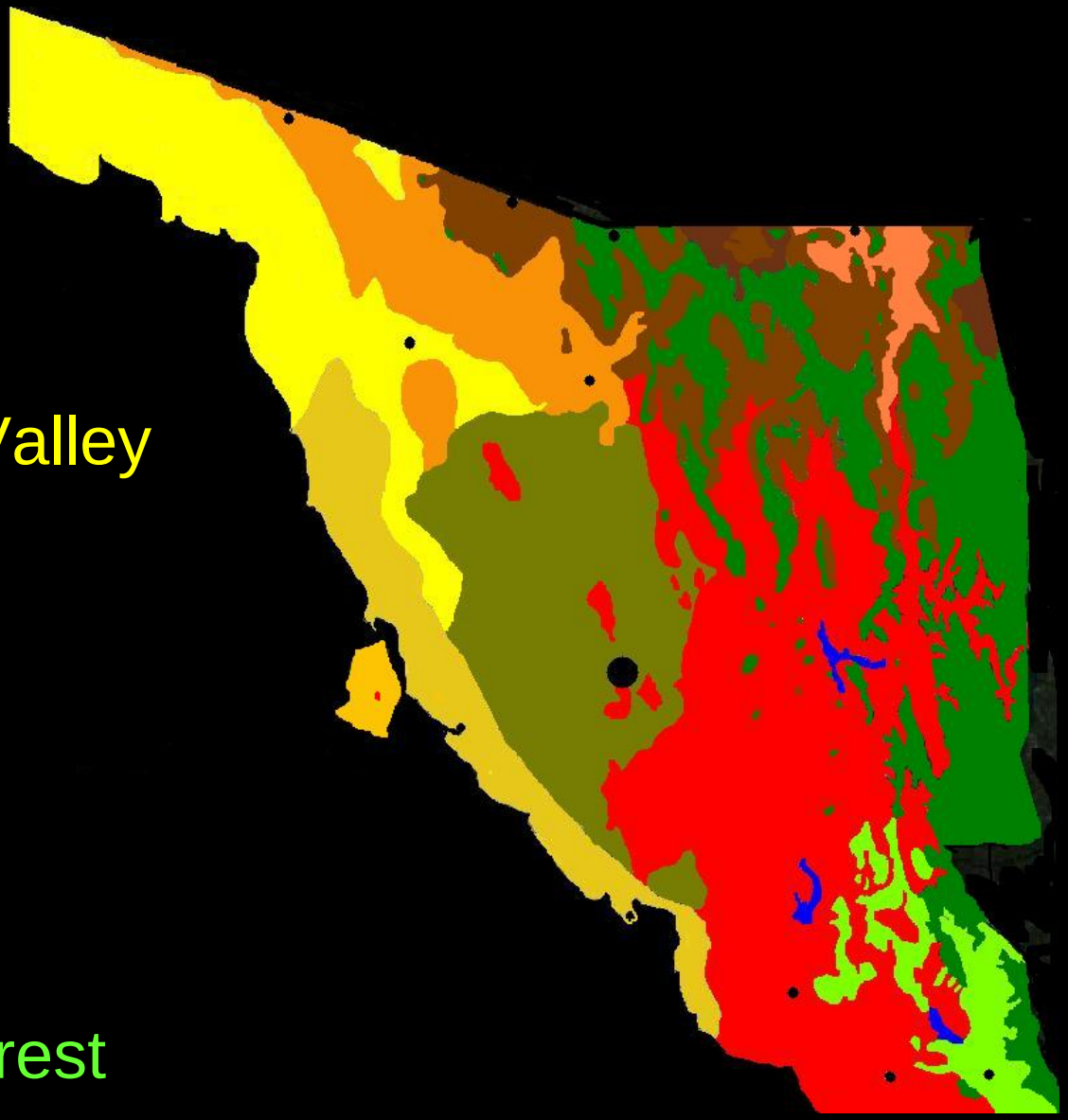
- Above 1,200 m
- Gran Desierto
- Chihuahuan
- Urban
- Agricultural

Design

Stratified Random Sample
Two Levels:

- Major Vegetation Type
- Topographic Formation

Vegetation Strata



Arizona Upland

Lower Colorado River Valley

Central Gulf Coast

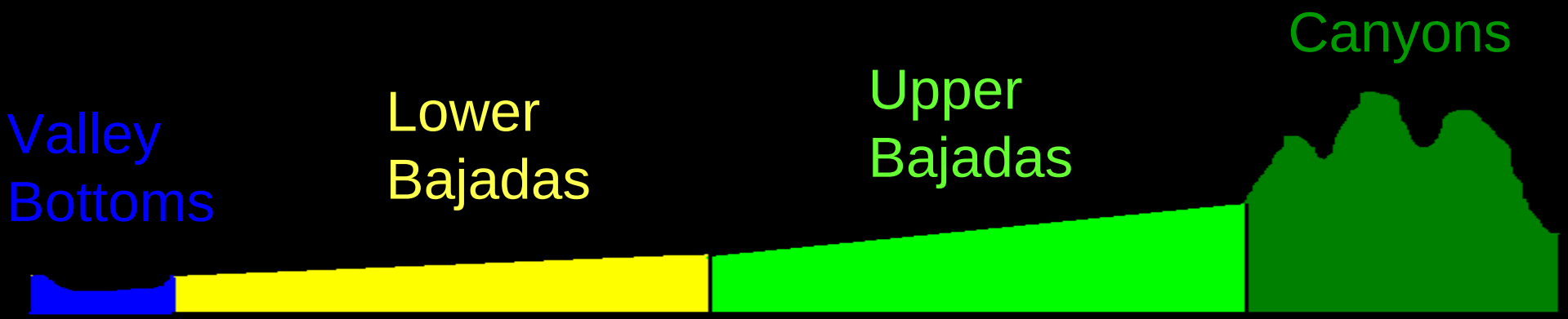
Plains of Sonora

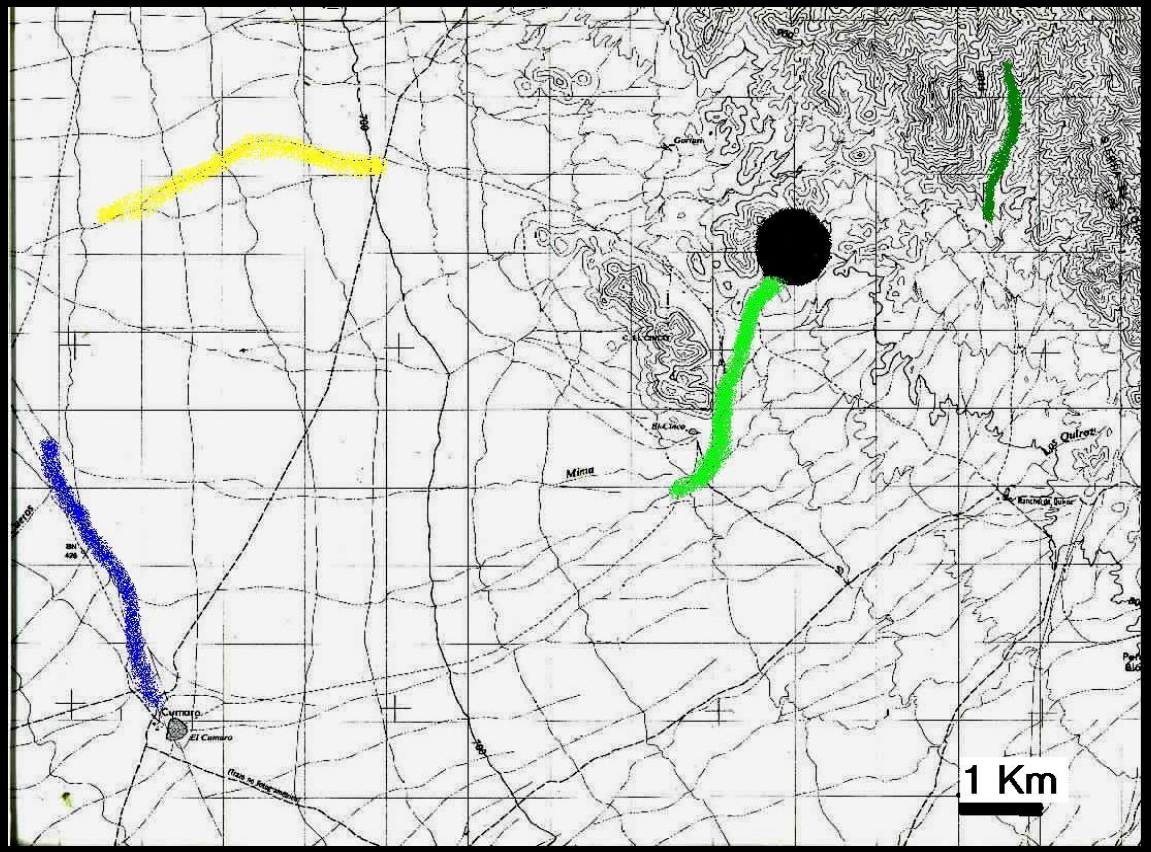
Semidesert Grassland

Sinaloan Thornscrub

Sinaloan Deciduous Forest

Site Selection & Topographic Formations





Owl Surveys

Tape Playback Surveys

- 1 hr before to 3 hrs after sunrise
- 8 min, 30-45 sec call sequences
- 350–400 m between points,
  550–600 m after detection
- Estimated distance to owls

Nest Searches

- In northern Sonora

Explanatory Variables

Physiography

- Province, elevation, latitude, longitude
- Slope, topographic complexity
- Drainage width and abundance

Vegetation

- Upland and Riparian associations
- Formation type and riparian width
- Canopy height and vegetation vol.
- Species composition

Cavity Substrates

- Abundance of large cacti and trees

Analyses

- Relative Abundance
- Density: by vegetation type, weighted by area of topographic formations
- Factors associated with:
  - occupancy along transects and stations
  - relative abundance along occupied transects

Effort

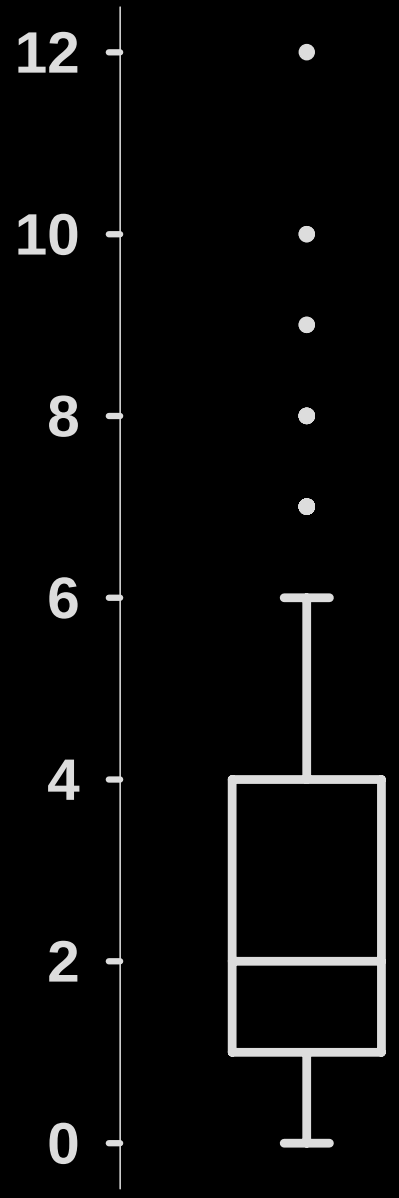
- 2,812 stations, 392 transects (1,115 km)
- Mean transect length = 2,719 m
  7.2 stations per transect
- 51 to 349 km transects per
  vegetation type

Results

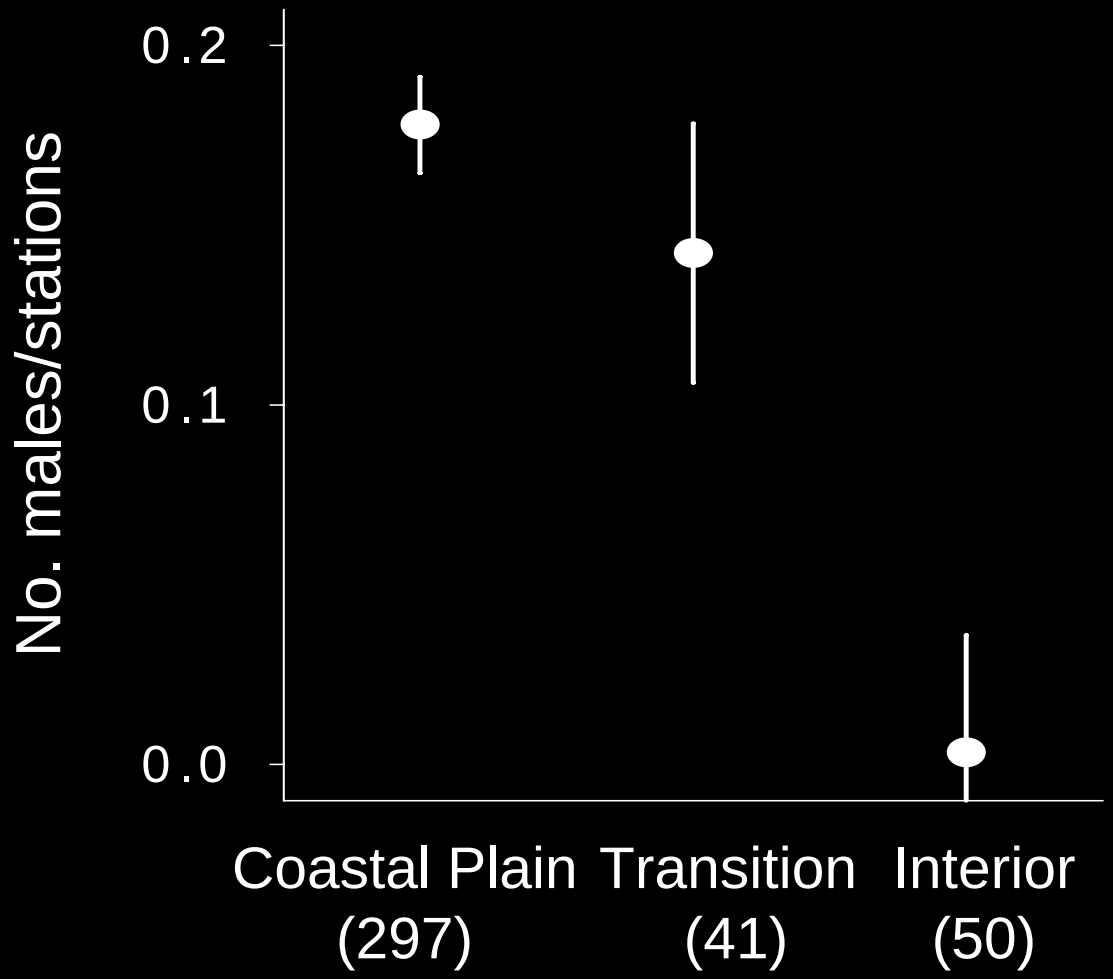
- 438 males, 74 females on transects
- 112 incidental individuals
- 102 nests, 262 young

Time to Detection

- 2.6 ± 0.1 min, *n* = 516
- 97.5% detections ≤7 min
- Range = 0–12 min

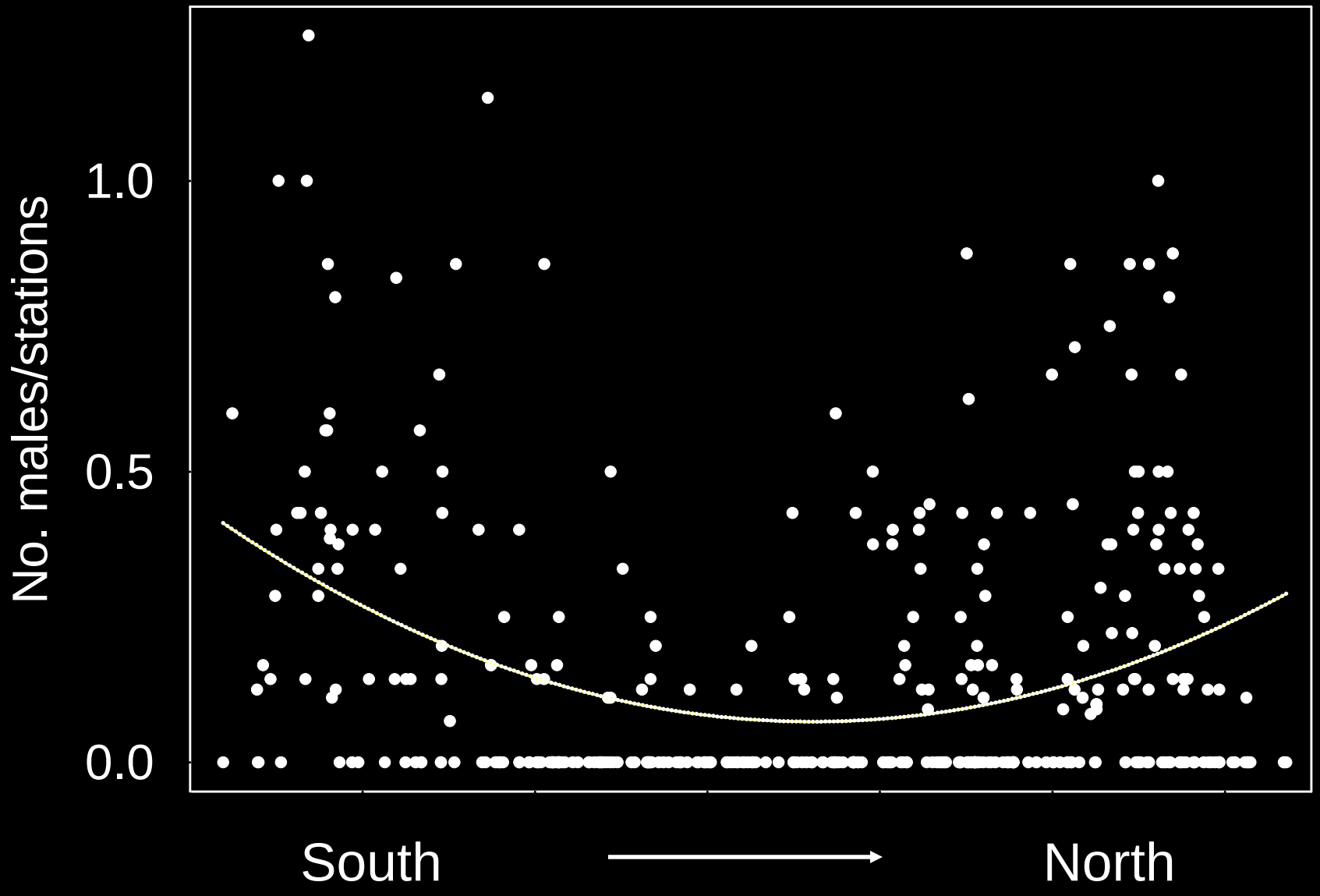


Physiographic Distribution



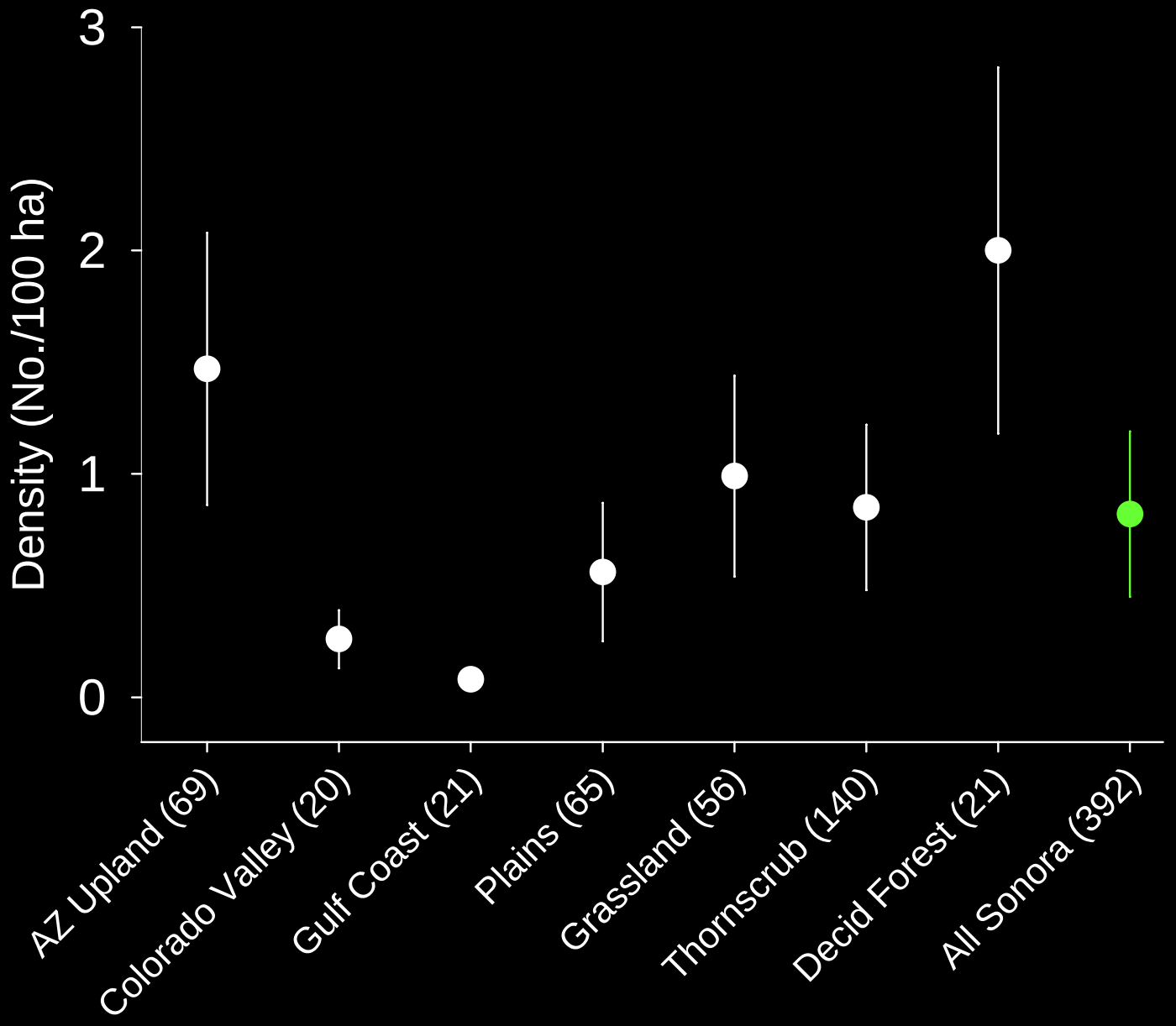
$F = 12.26$, $P<0.0001$

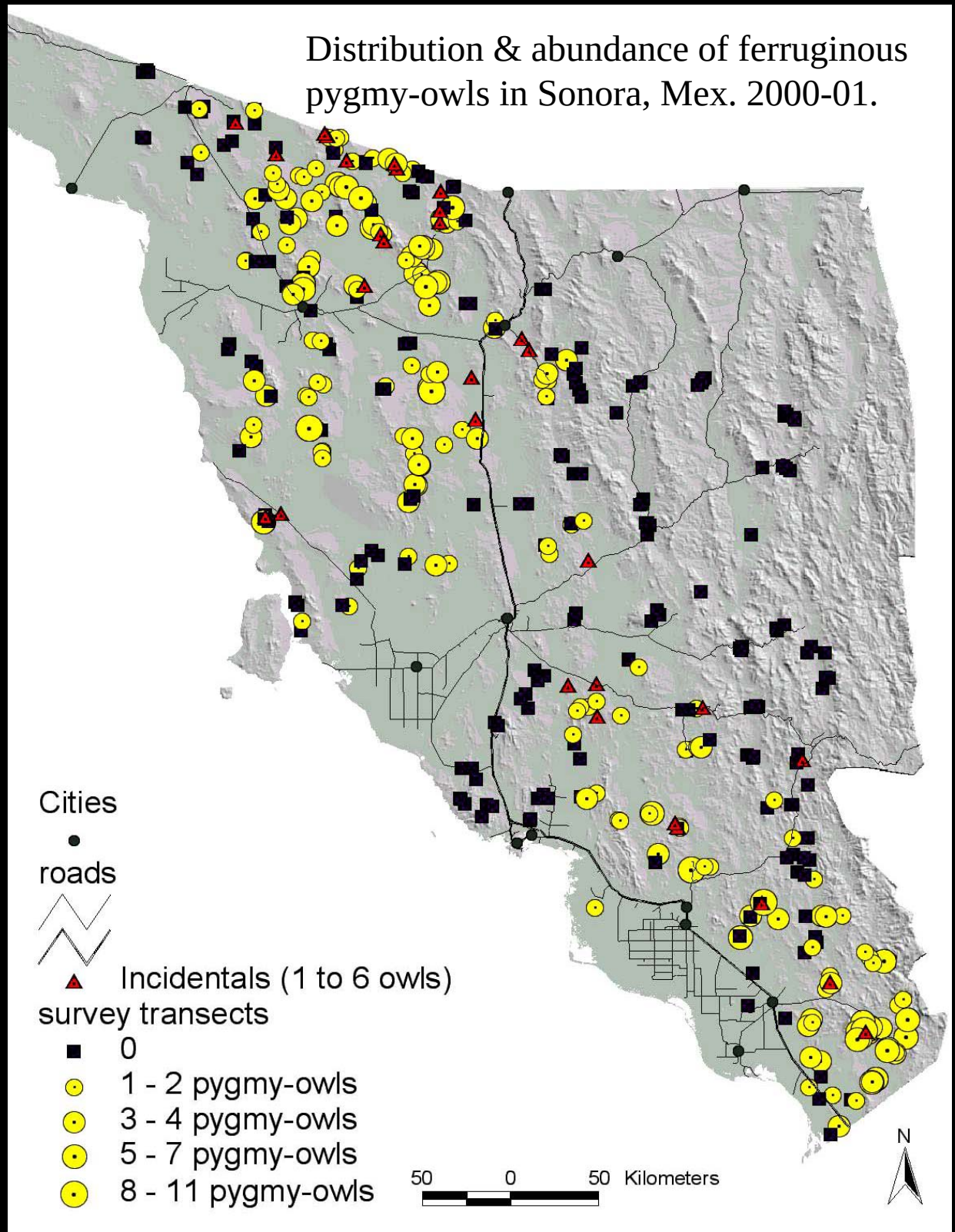
Relative Abundance Varied with Latitude

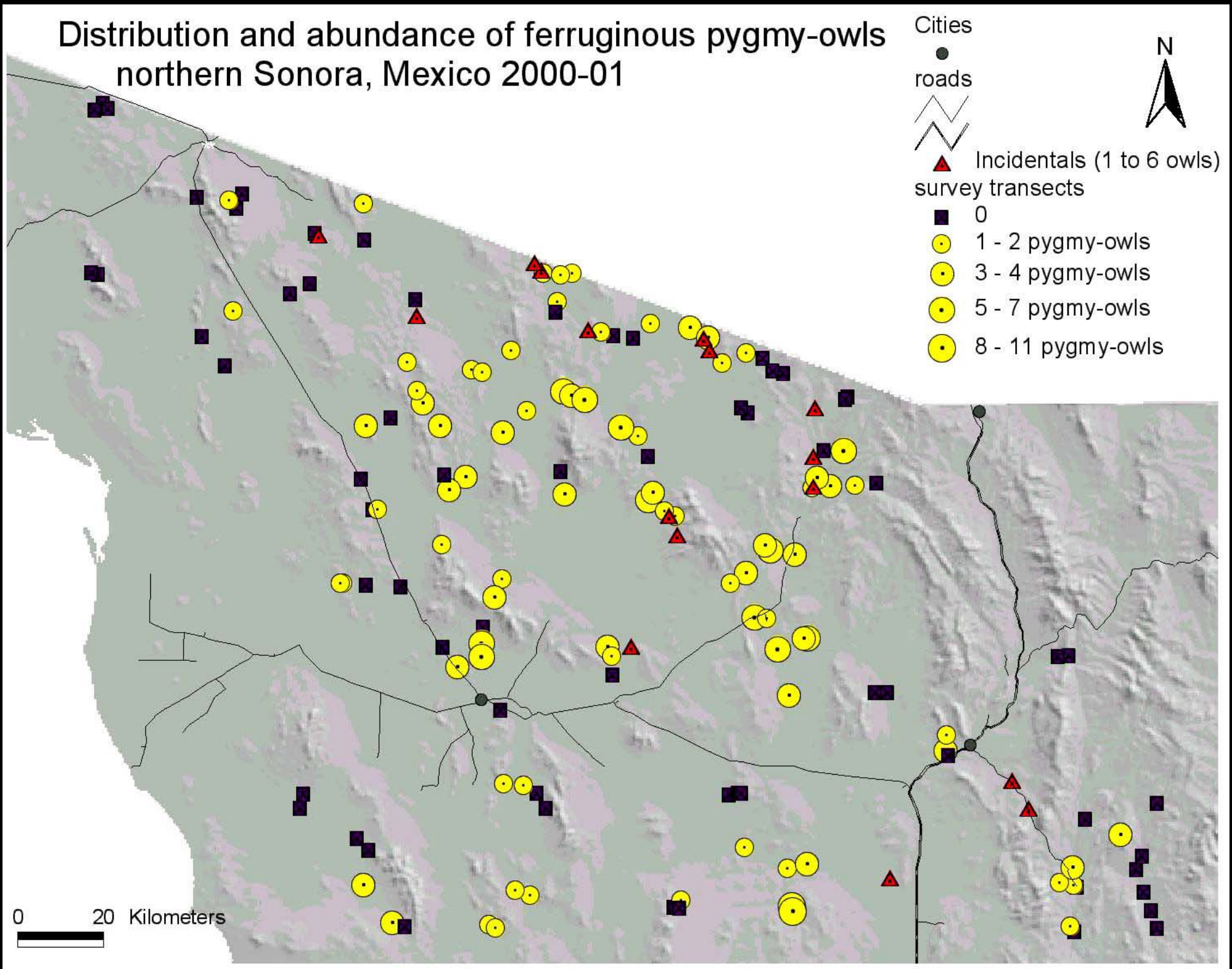


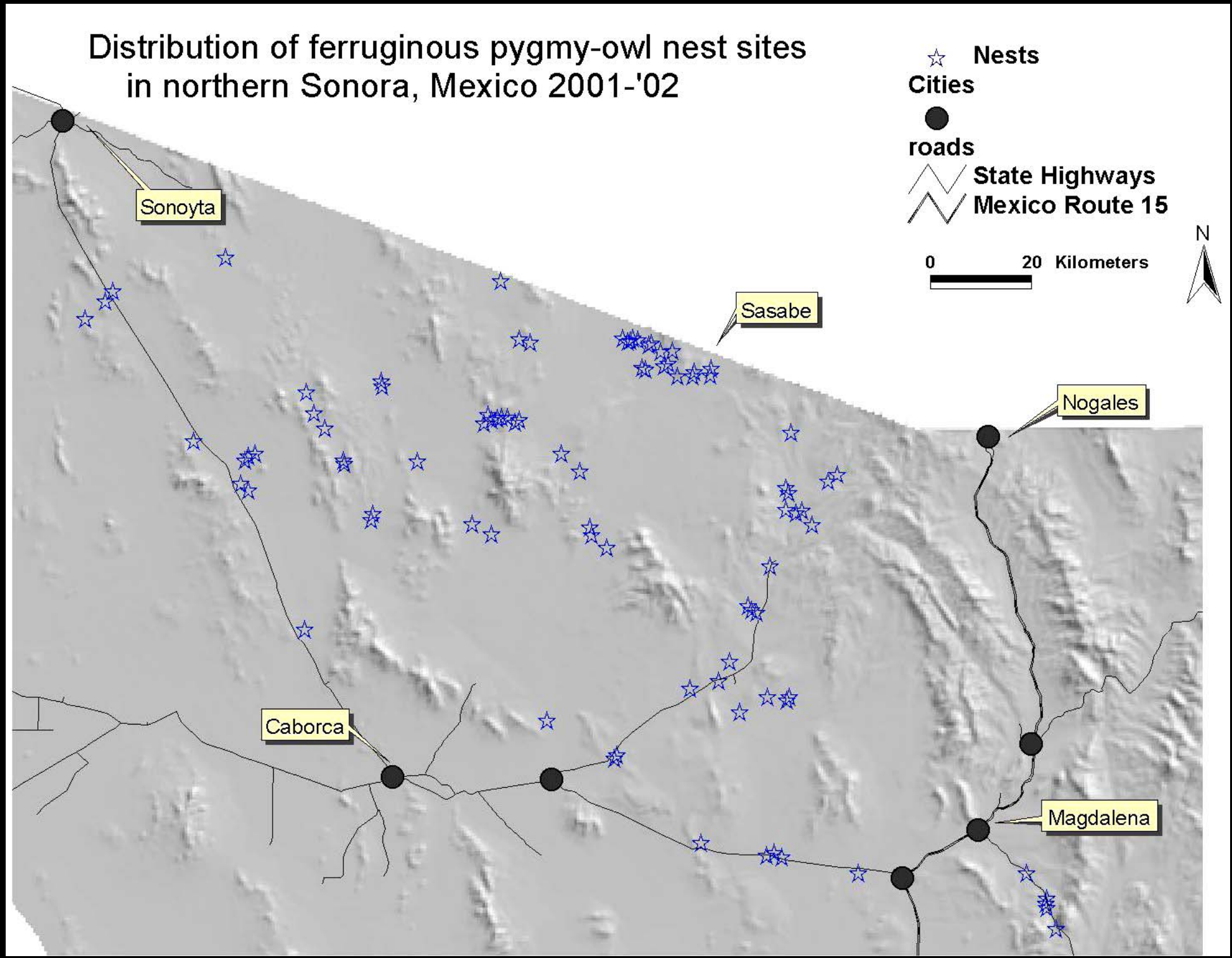
$F = 21.50$, $P < 0.0001$

Density across Vegetation Types

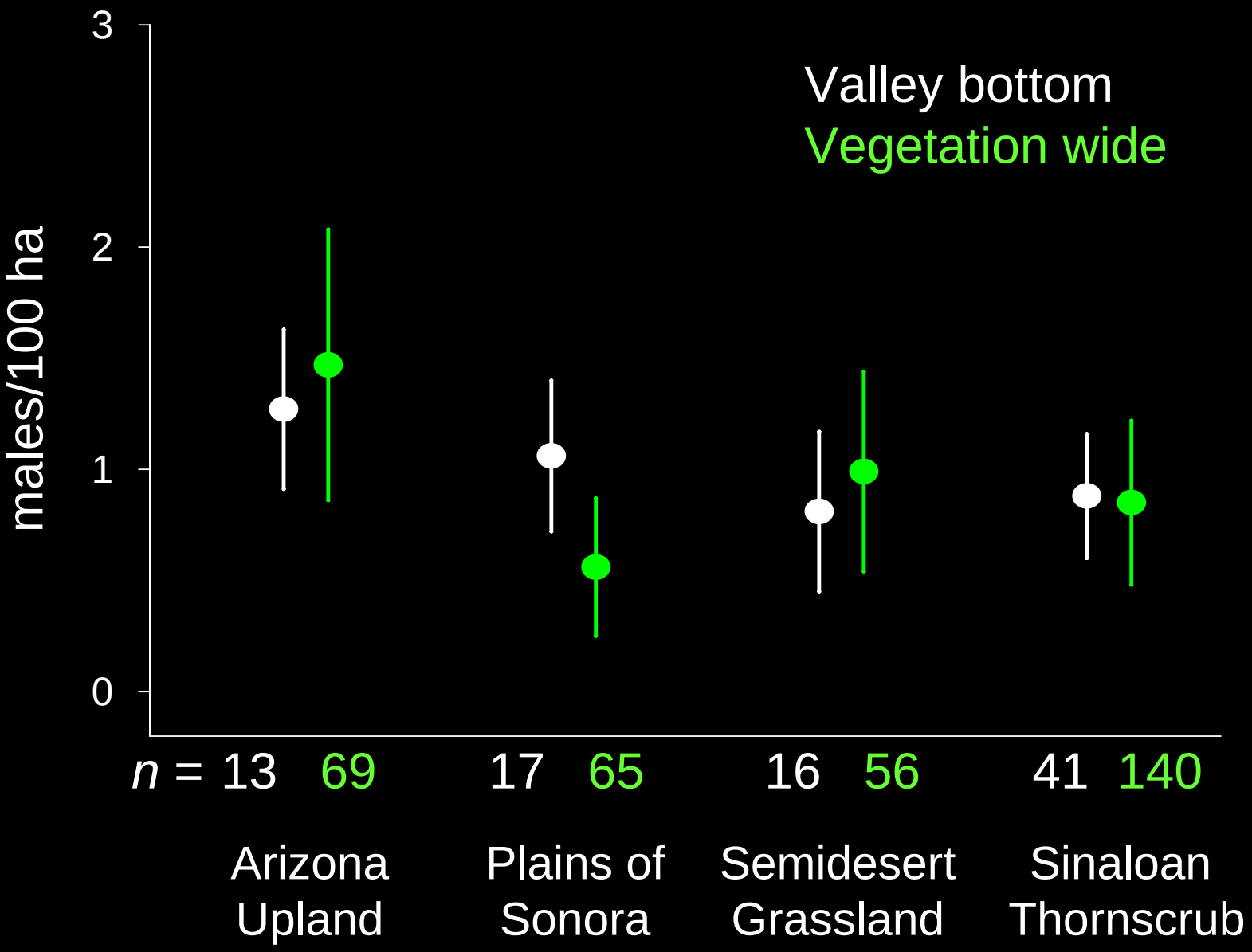



Distribution & abundance of ferruginous pygmy-owls in Sonora, Mex. 2000-01.
Cities
roads
Incidentals (1 to 6 owls)
survey transects
0
1 - 2 pygmy-owls
3 - 4 pygmy-owls
5 - 7 pygmy-owls
8 - 11 pygmy-owls
50 0 50 Kilometers
N

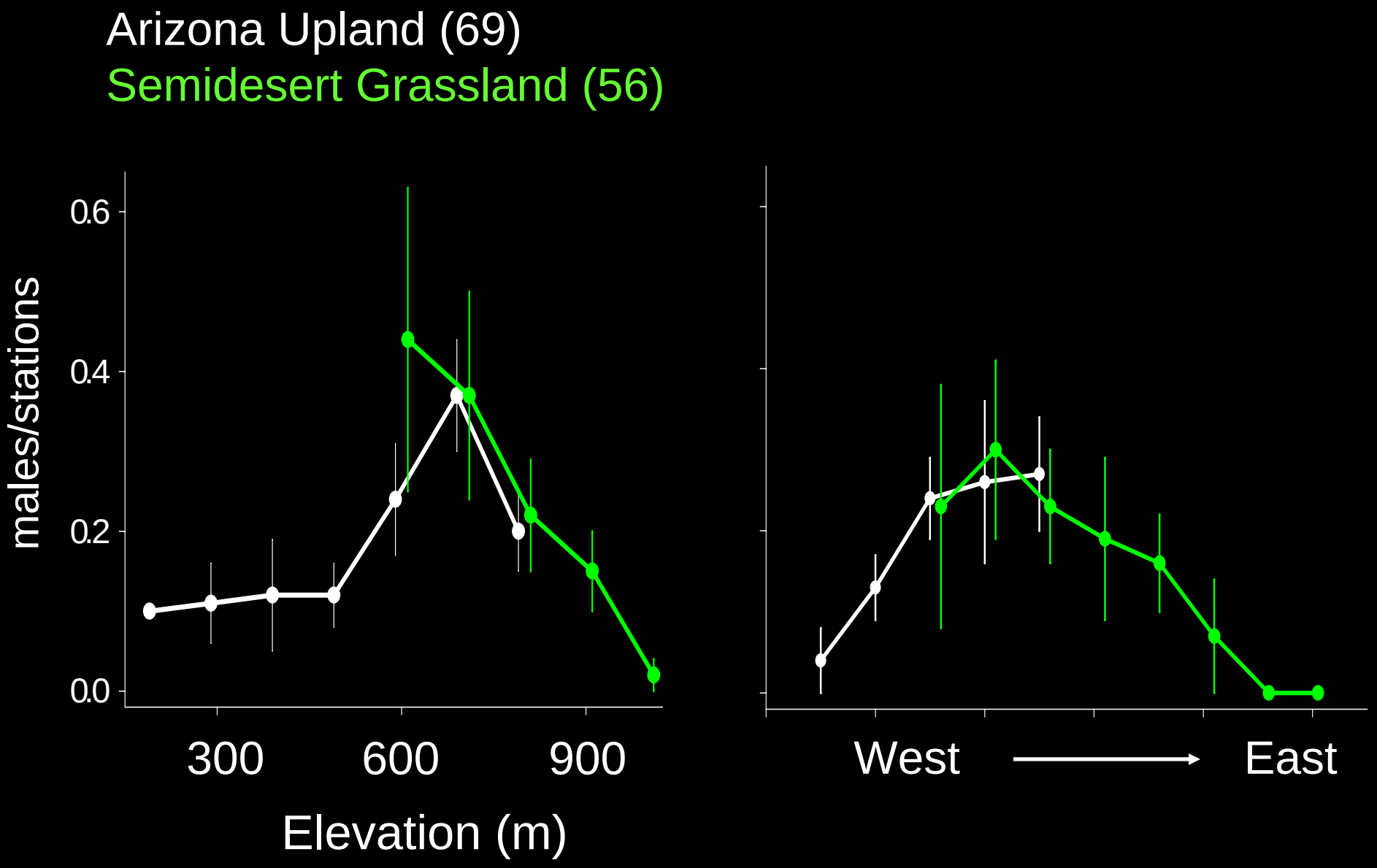

Distribution and abundance of ferruginous pygmy-owls
northern Sonora, Mexico 2000-01
Cities
roads
N
Incidentals (1 to 6 owls)
survey transects
0
1 - 2 pygmy-owls
3 - 4 pygmy-owls
5 - 7 pygmy-owls
8 - 11 pygmy-owls
0
20 Kilometers


Distribution of ferruginous pygmy-owl nest sites
in northern Sonora, Mexico 2001-'02
Nests
Cities
roads
State Highways
Mexico Route 15
0
20 Kilometers
N
Sonoyta
Sasabe
Nogales
Caborca
Magdalena

Density along Valley Bottoms

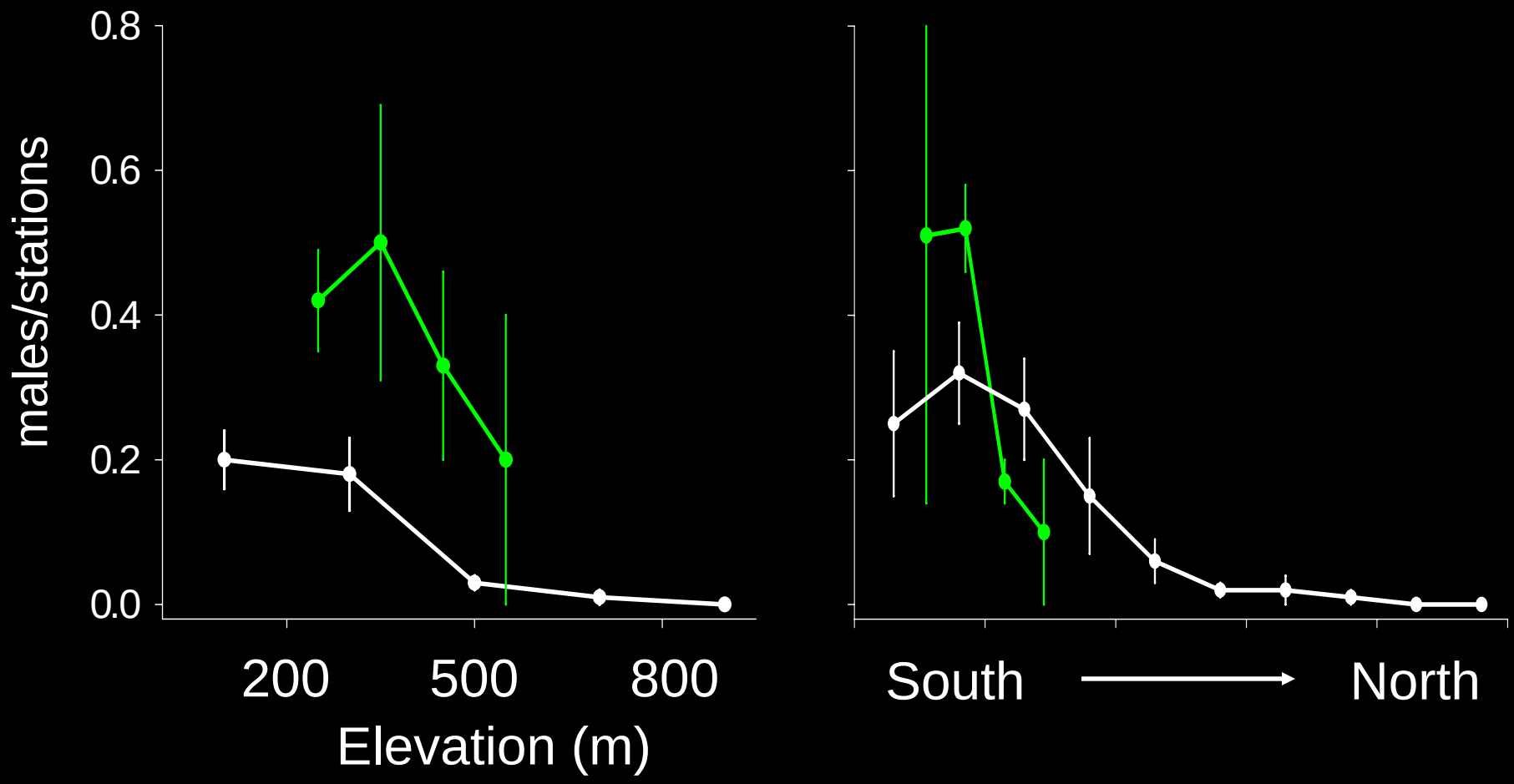


Relative Abundance by Elevation and Longitude

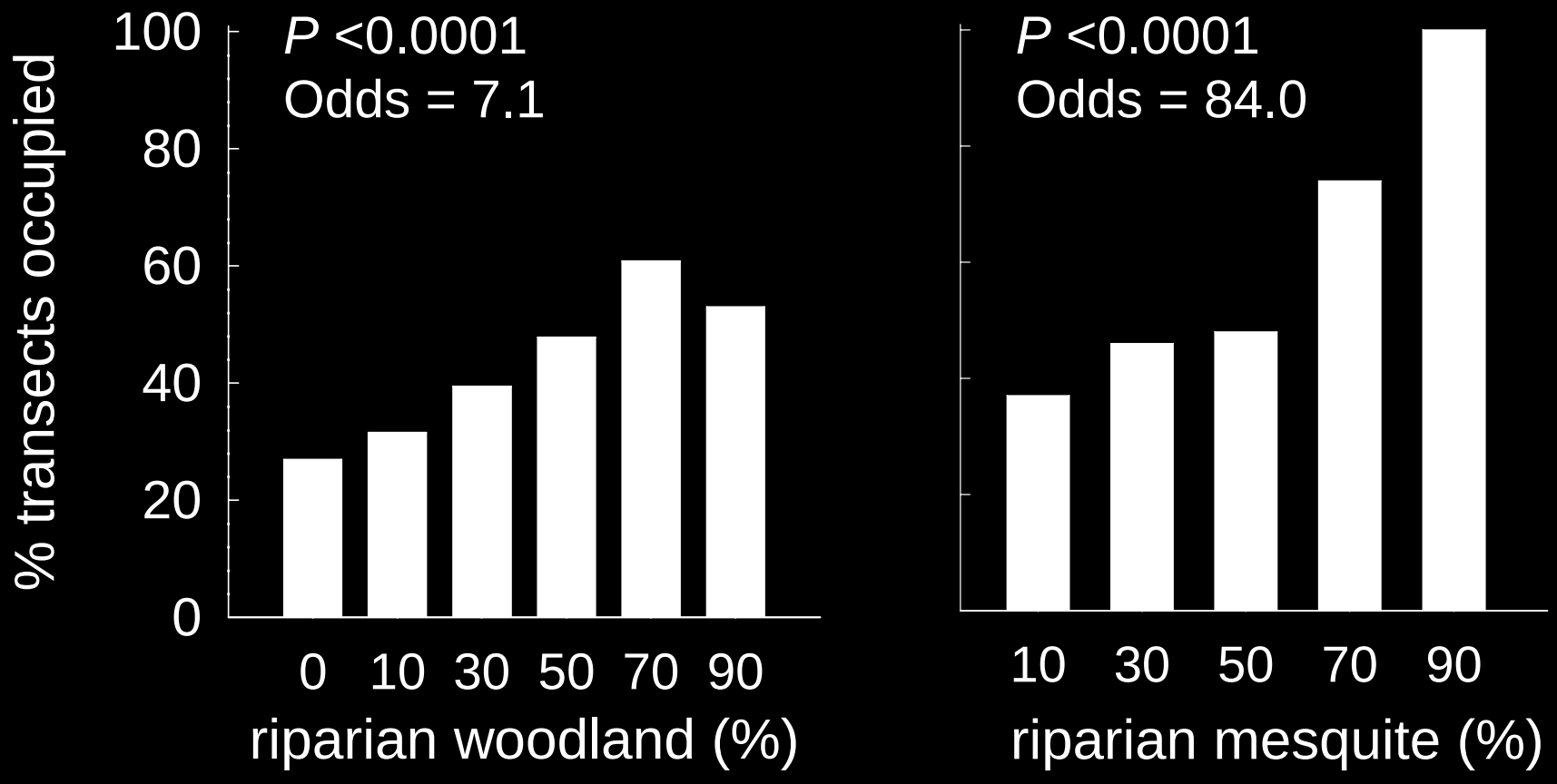


Relative Abundance by Elevation and Longitude

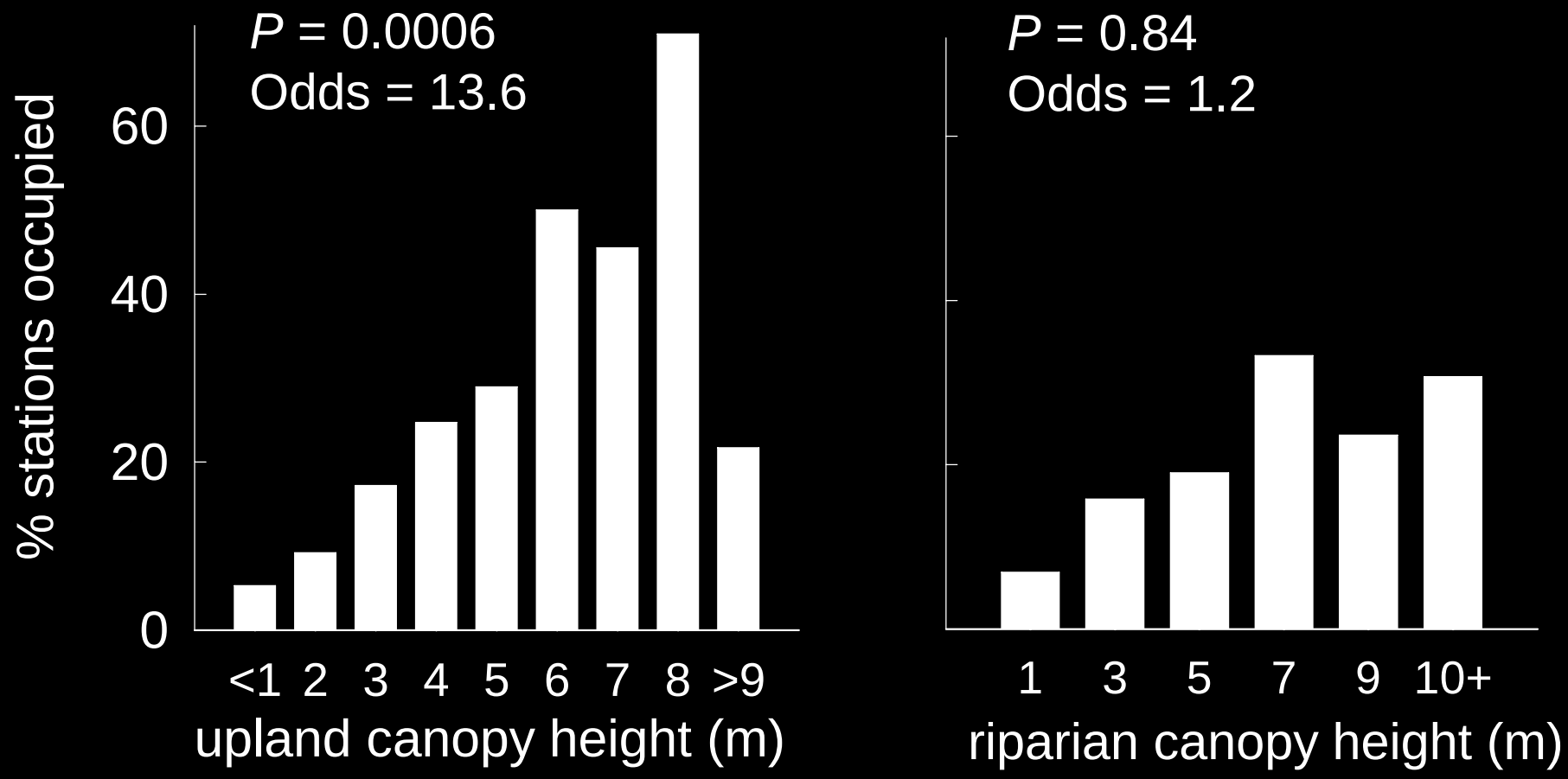
Sinaloan Thornscrub (140)
Sinaloan Deciduous Forest (21)



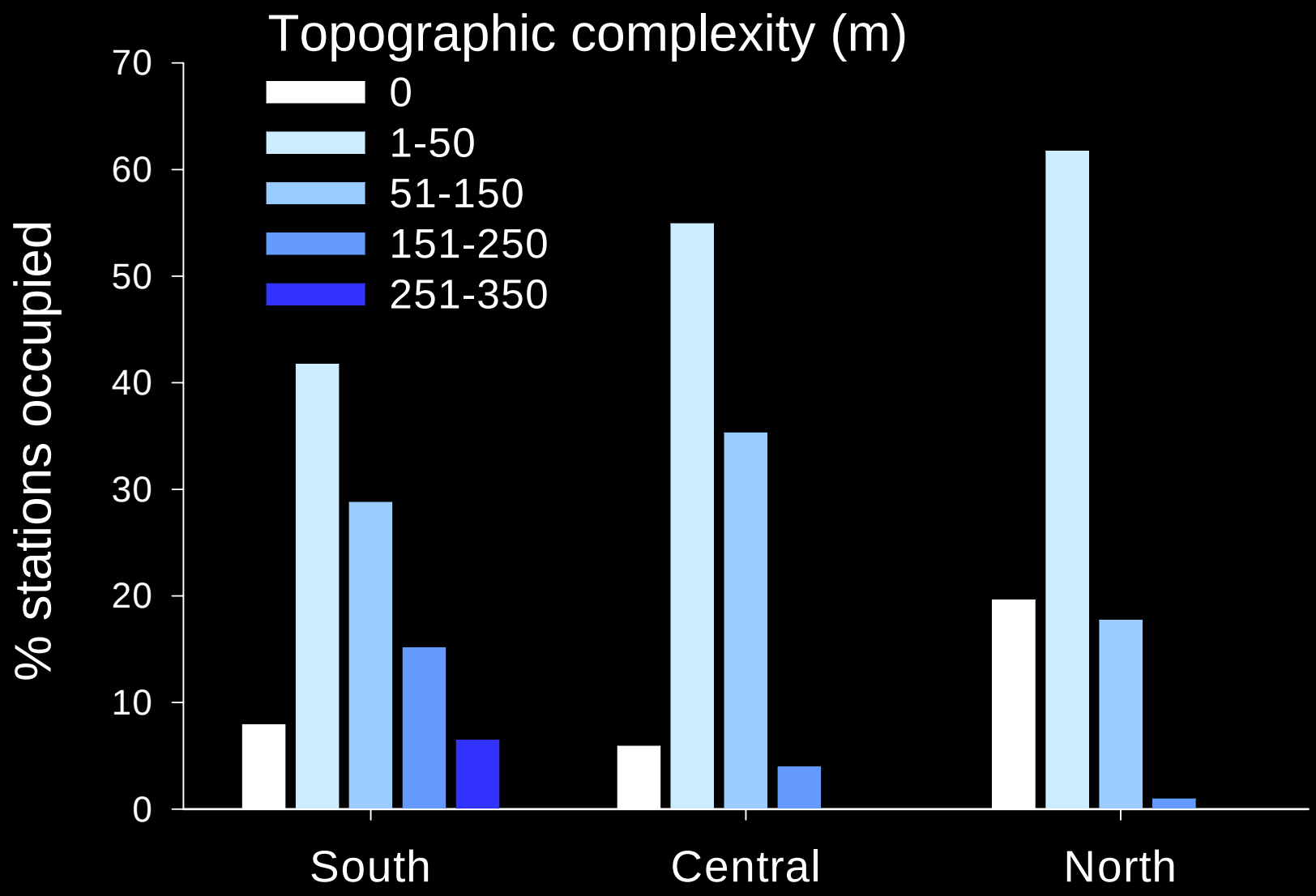
Occupancy along Transects



Occupancy at Stations

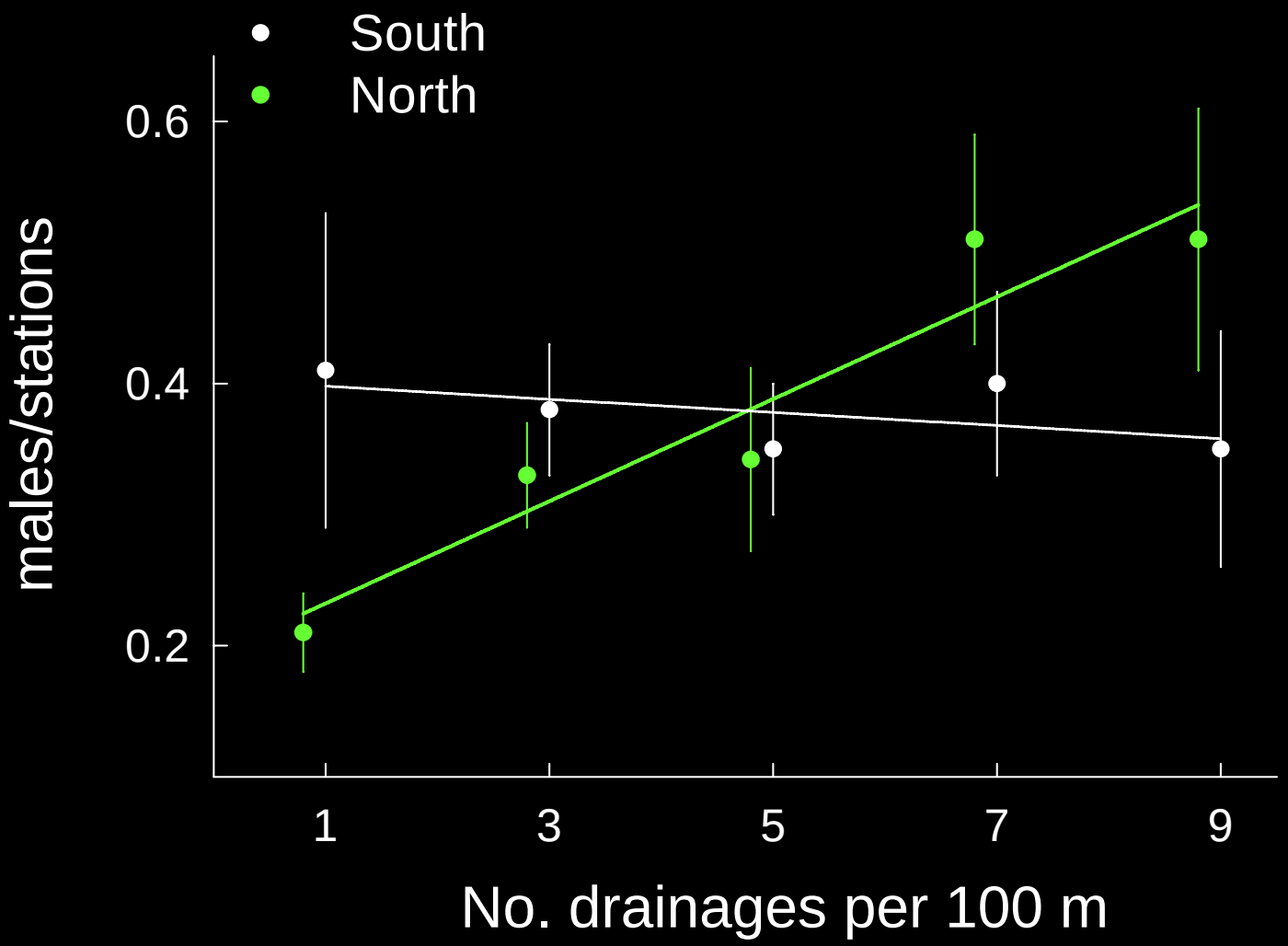


Occupancy at Stations



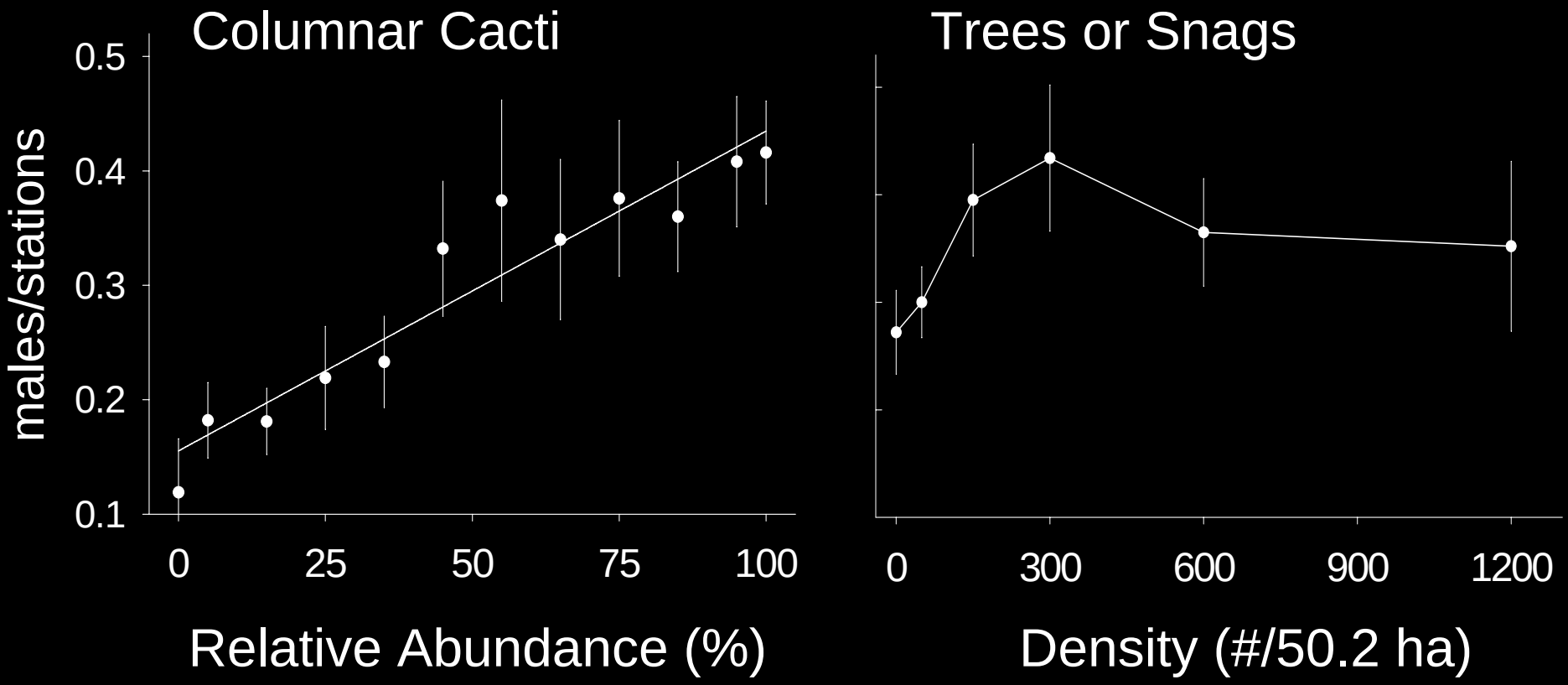
P = 0.003, for interaction

Relative Abundance: Drainage Density



P = 0.094, for interaction

Relative Abundance: Cavity Substrates



Conclusions

- Pygmy-owls well distributed throughout Sonora
- Enhanced recovery potential in Arizona
- Why so few owls in adjacent Arizona?
- Aid recovery?


G. Proudfoot


N. Smith

Acknowledgements

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