Bendire's Thrasher Nest and Juvenile Survival in Relation to Vegetation Characteristics in the Southwest United States

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Overview

- Introduction
- Nest Survival
- Juvenile Survival
- Future Analysis

Introduction

Objectives

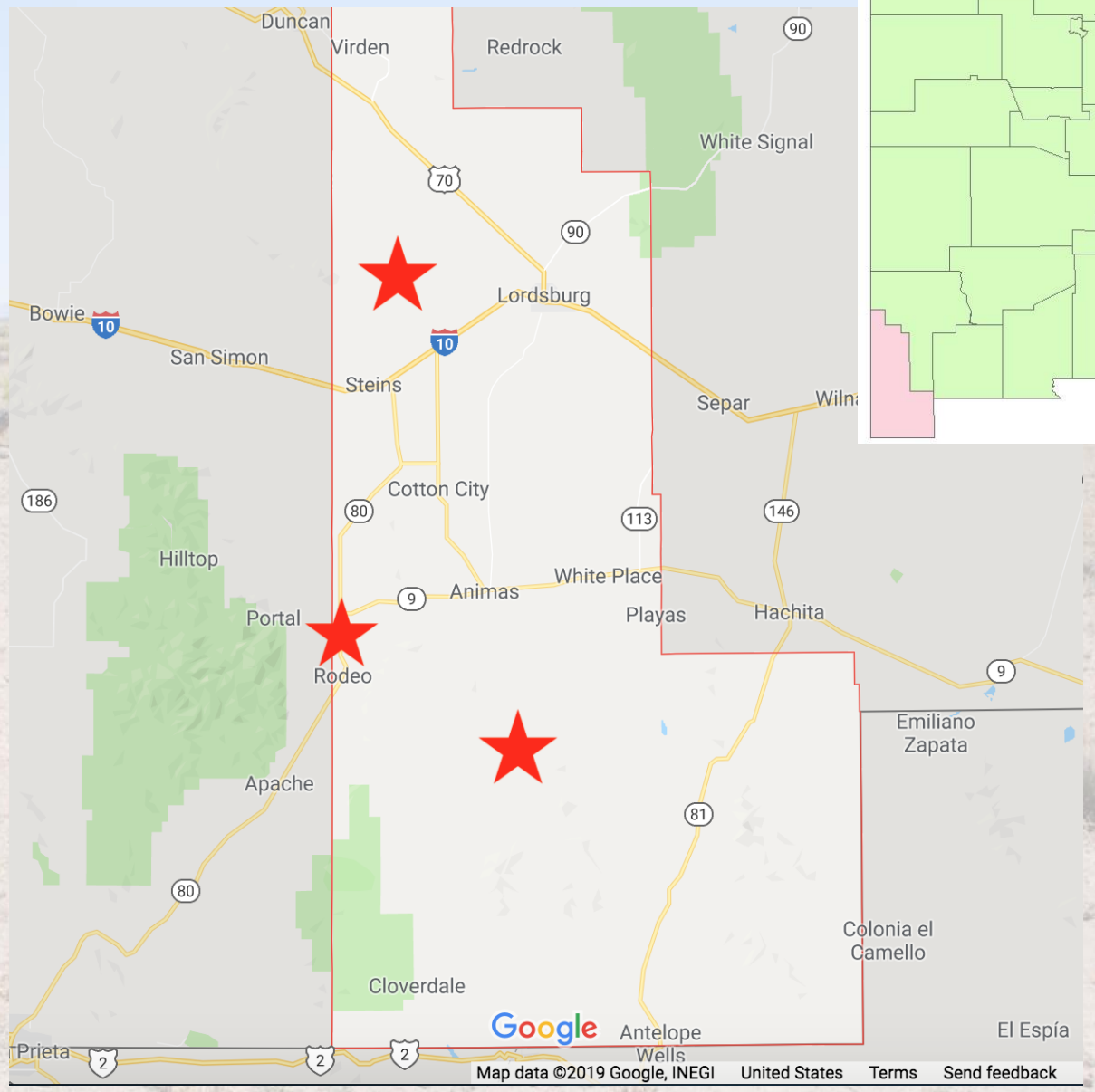
- Determine basic breeding biology
- Determine daily nest survival estimates
- Determine survival estimates and movement patterns of post-fledglings

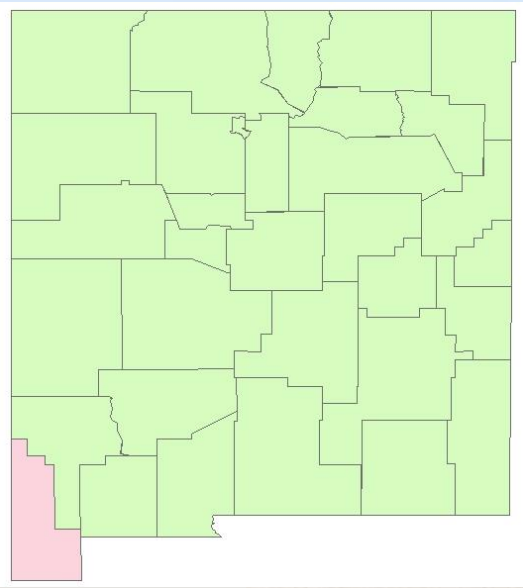
Field Site

- Hidalgo County
- Two main cluster locations

Duration of study

- February-July





Nest Survival

Hypothesis – Nest Survival

Nest Site Scale
- Nest Concealment
- Nest Height
- Distance to Edge
- Nest Age

Territory and Landscape Scale
- Visual Obstruction
- Food Abundance
- Presence of Curve-billed Thrasher
- Habitat Heterogeneity
- Temperature and Bioyear precipitation

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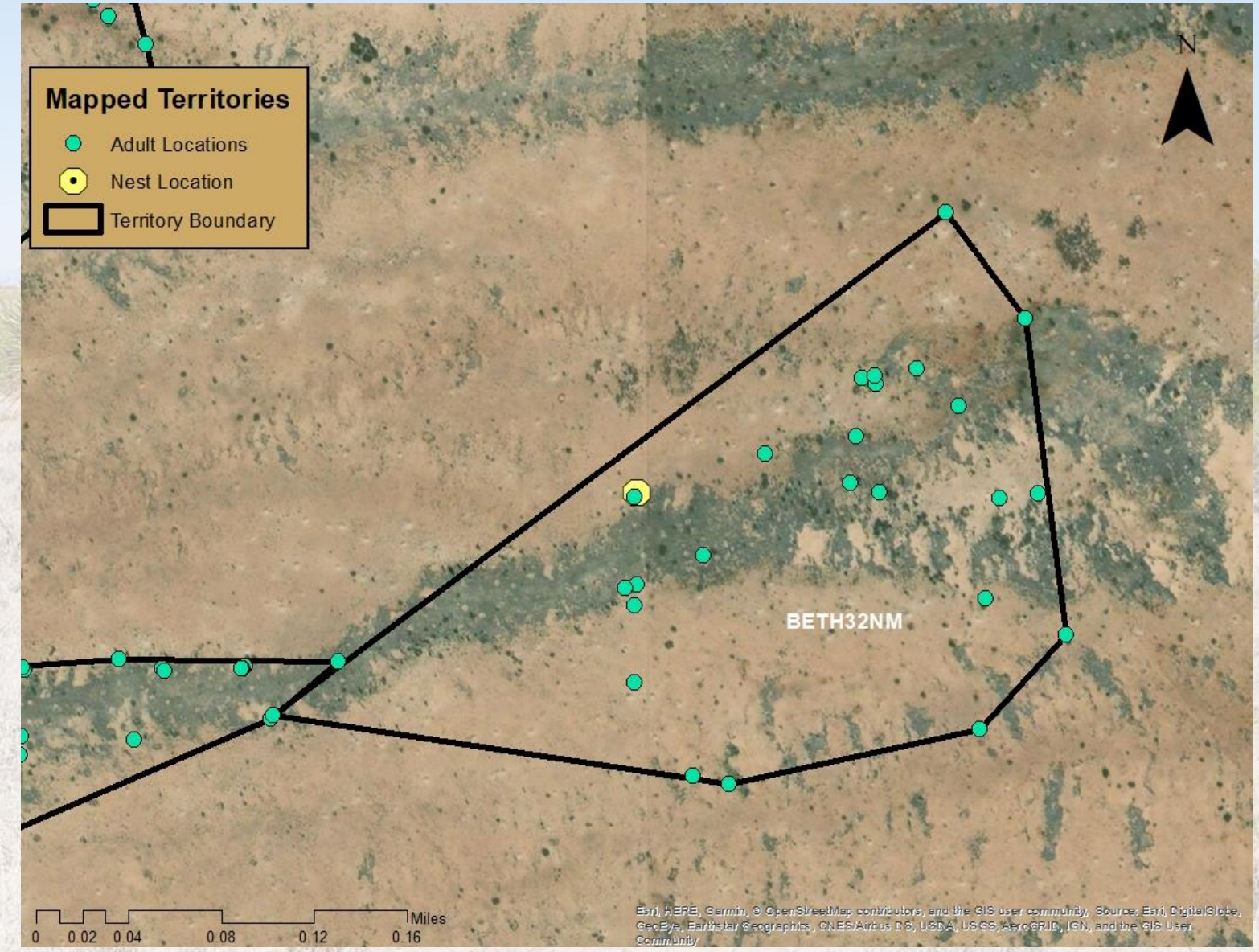
Methods

Field Data Collection

- Territory Mapping
- Nest Searching
- Nest Monitoring
- Insect Collection
- Point-count Surveys
- Vegetation Data Collection

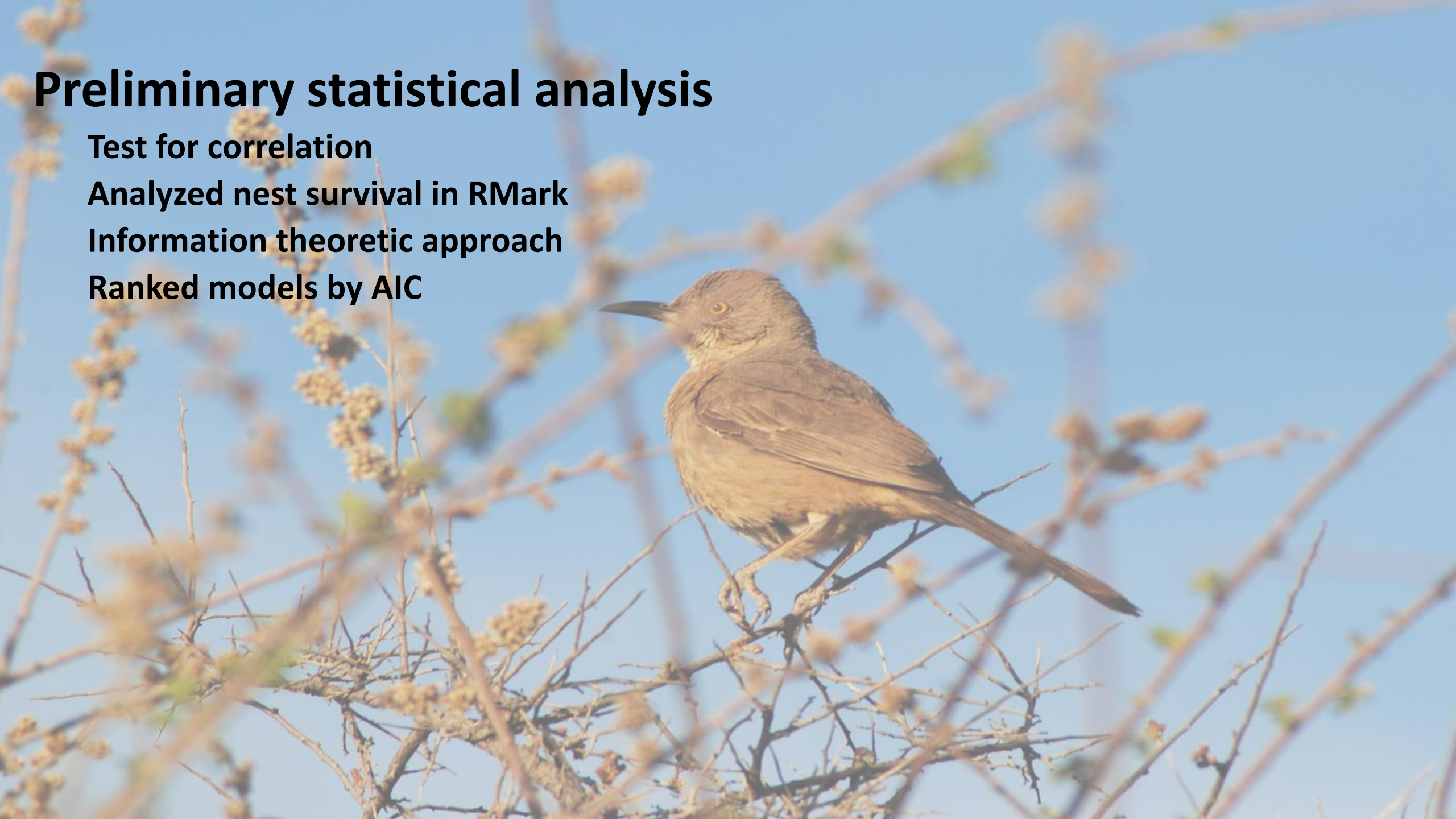


Preliminary Nest Site Model Variables

Scale	Variable	Description
Nest Site	Nest Height	Height (m) from the ground to the bottom of the nest cup
	Distance to Edge	Distance (cm) from the nest edge to the end of the longest branch that supports the nests
	Concealment	Concealment measured from and averaged across each of the cardinal directions around the nest
	Nest Substrate	Nest shrub species used for nesting is yucca (1) or non-yucca shrub (0)
Temporal	Nest Age	Age of the nest from start of incubation date, or last day an egg was laid until failure or fledging
	Day of Season	Numerical date from start of the nesting season (day1)

Preliminary statistical analysis

- Test for correlation
- Analyzed nest survival in RMark
- Information theoretic approach
- Ranked models by AIC



Preliminary Results –Nest Survival

	$\bar{X}$	SD
Initiation Date (1st clutch, n=30)	117.57(Julian) (4/27/18)	20.49
Initiation Date (2nd clutch, n=8)	150.13(Julian) (5/30/18)	17.06
Clutch Size	2.77	0.86
Nestlings	1.93	1.17
Fledglings	0.9	1.24
Age at Fledging (n=9)	13.3	1.41

Nest Predators

- Chihuahuan Ravens
- Coyotes
- Javelina
- Cattle
- Rodents

Preliminary Model Set

Model	Description
1	Null
2	Date (Day of Season)
3	Nest Age
4	Yucca (Nest Shrub Species)
5	Distance to Edge (DTE)
6	Concealment
7	Nest Height
8	Date + Nest Age
9	Yucca + Nest Age
10	Nest Height + Nest Age
11	Yucca + DTE + Concealment
12	Nest Height + DTE + Concealment
13	Nest Height + Yucca + DTE + Concealment
14	Nest Height + Yucca + Nest Height * Yucca
15	Global Model = Date + Nest Age + Yucca + DTE + Concealment + Nest Height

Preliminary Model Results – Nest Survival

	Model	K	AICc	ΔAICc	Wt	Dev
3	Date	2	103.70	0.00	0.23	99.66
8	Date + Nest Age	3	103.88	0.18	0.21	97.81
9	Yucca + Nest Age	3	104.46	0.76	0.15	98.39
2	Nest Age	2	105.76	2.06	0.08	101.73
10	Nest Height + Nest Age	3	106.31	2.61	0.06	100.24
4	Yucca	2	106.88	3.18	0.04	102.85
14	Nest Height + Yucca + Nest Height * Yucca	4	106.93	3.24	0.04	98.82
1	Null	1	106.95	3.26	0.04	104.94

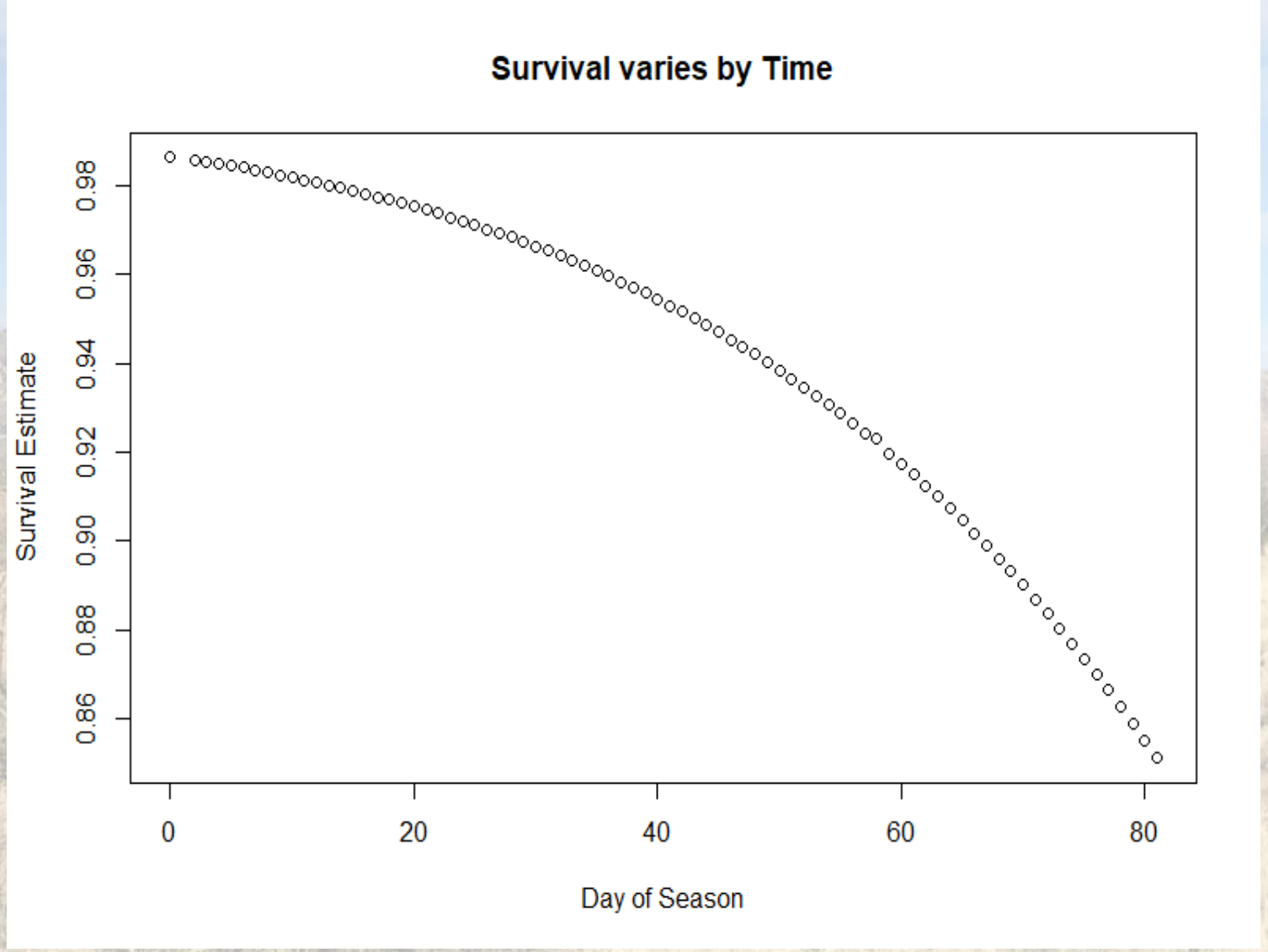
K = number of parameters
AICc – AIC value for small sample size
ΔAICc = Change in AIC value
Wt = Weight
Dev = Deviance

Preliminary Survival Estimates

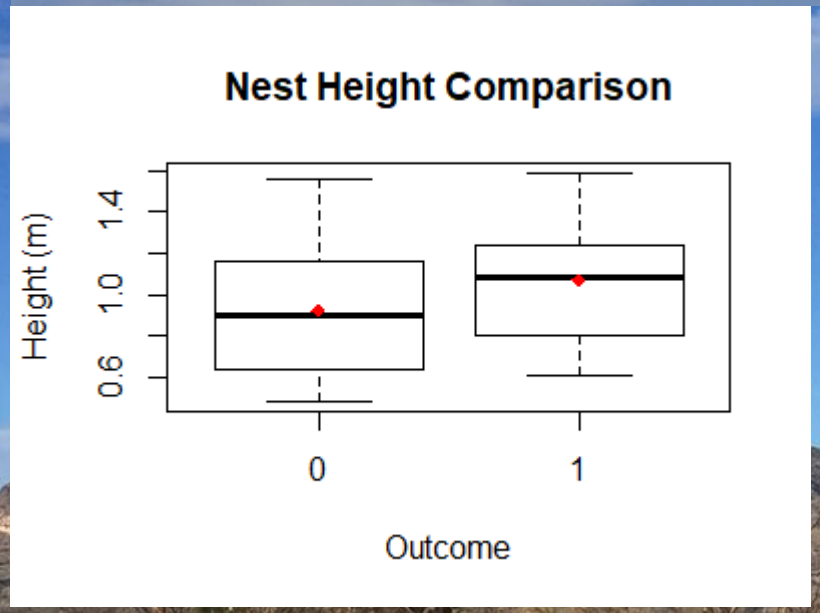
Daily survival rate –
0.95 ± 0.01
95% CI: 0.93-0.97

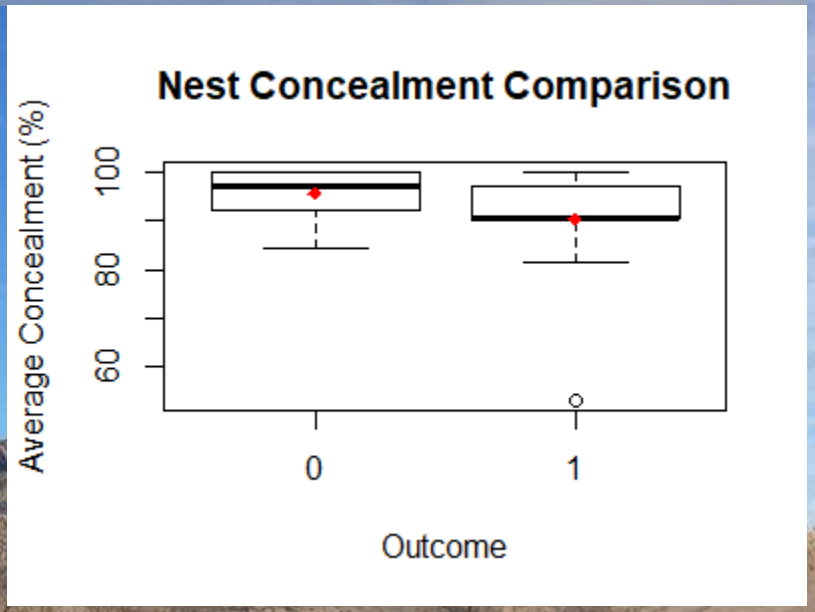
Probability of successful breeding attempt –
32%

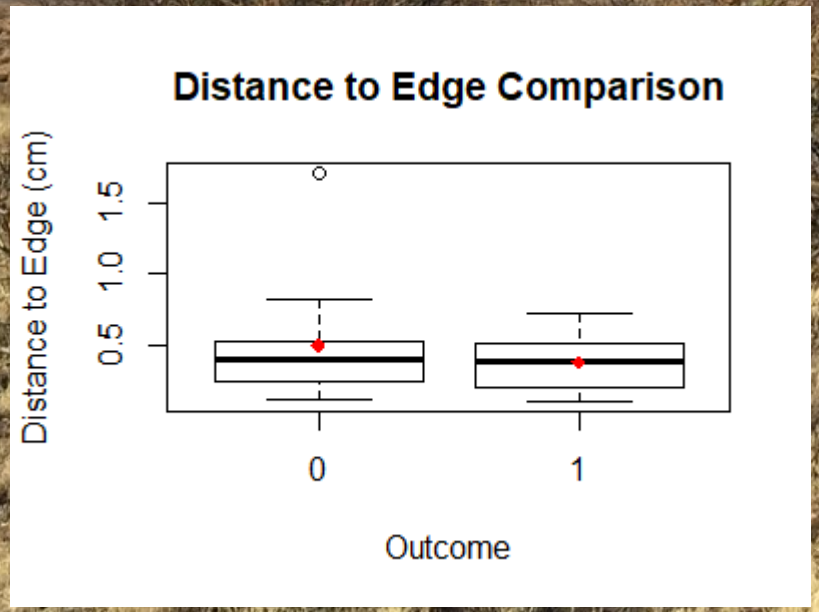
Preliminary Results – Nest Survival

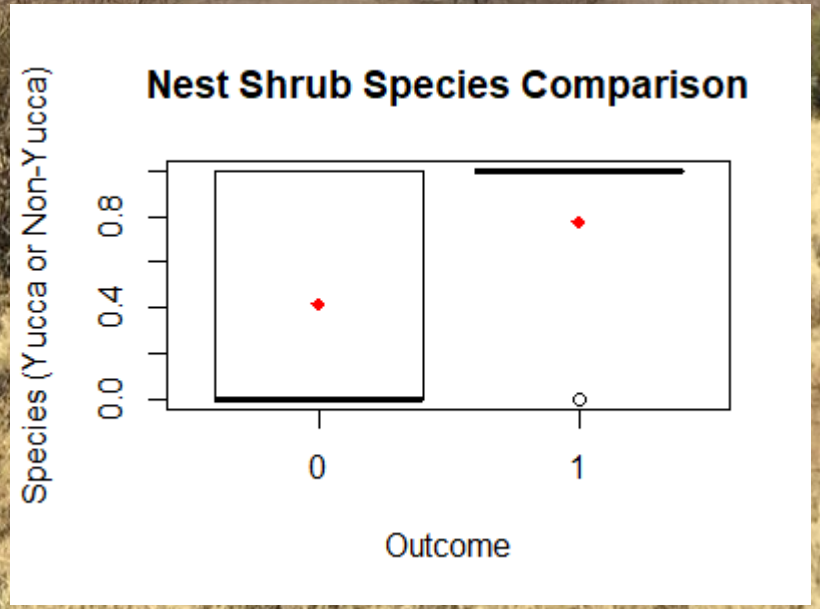


Preliminary Results – Nest survival









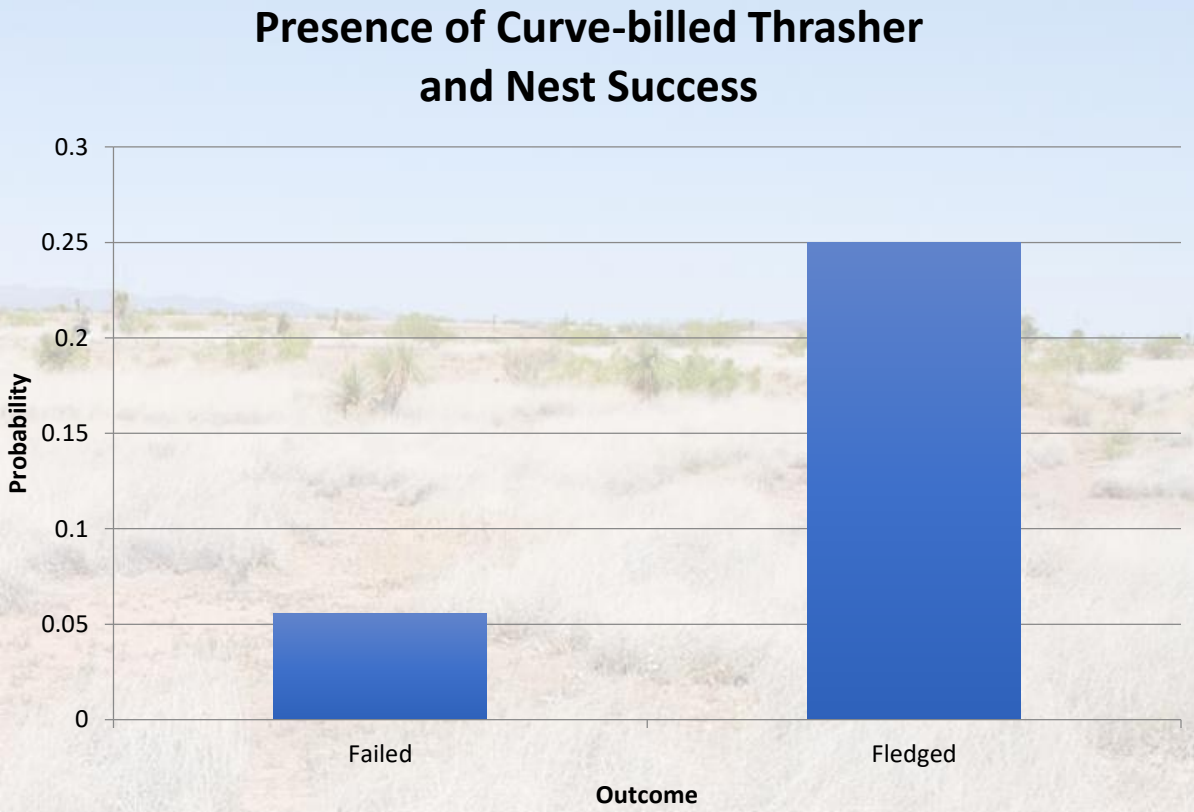
Preliminary Results – Nest Survival

Comparison of used nesting shrub to non-used nesting yuccas within the territory

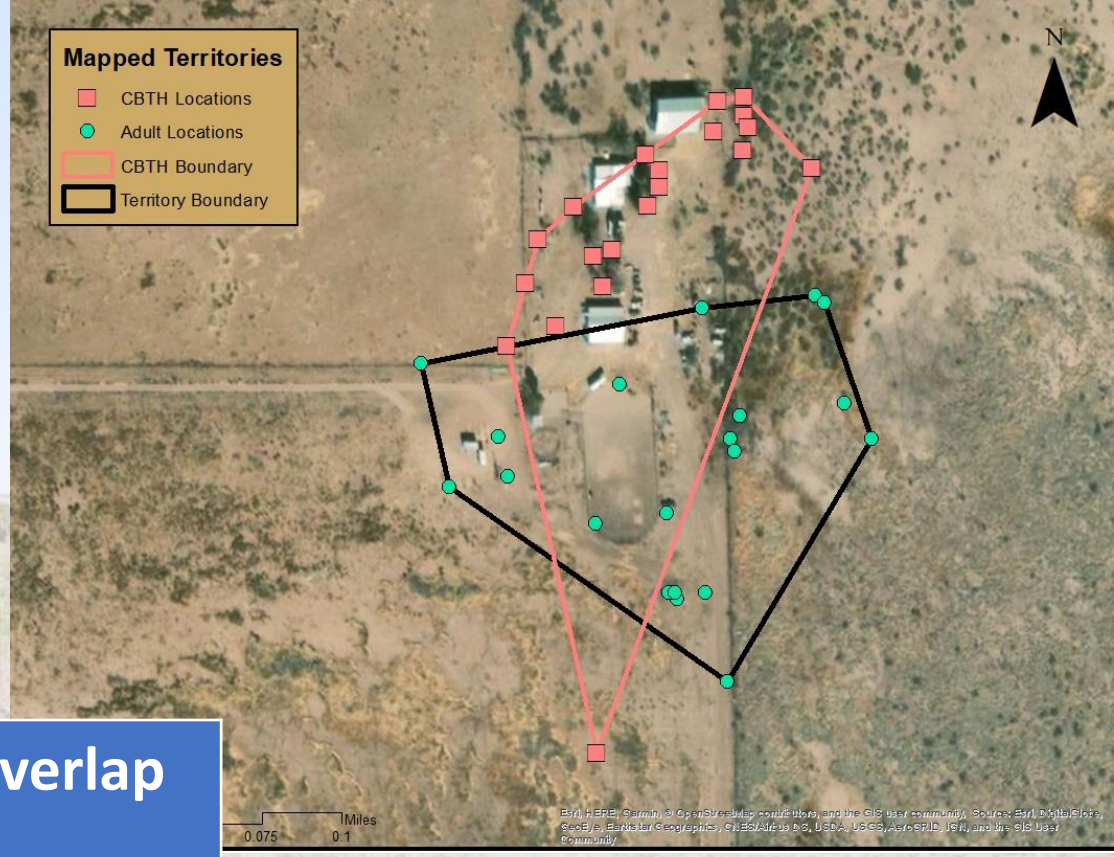
Outcome	Average Nest Height (m)	SD	Average Nest Shrub Height (m)	SD	Average Yucca Height (m)	SD
Successful (Yucca) (n=5)	1.09	0.36	2.36	0.66	1.40	0.28
Failed (Yucca) (n=14)	1.06	0.29	2.39	0.73	1.44	0.86
Successful (Non-Yucca) (n=7)	0.80	0.25	1.83	0.60	0.53	0.51
Failed (Non-Yucca) (n=4)	1.08	0.31	3.15	1.21	0.77	0.21

Preliminary Results – Nest Survival

Photo by Christina Kondrat-Smith – Desert Thrasher Working Group



Preliminary Results – Nest Survival



BETHID	Overlap (ha)	BETH Territory Size (ha)	% Overlap
BETH14	0	14.82	0
BETH10	0.12	7.05	1.75
BETH11	0.16	14.67	1.07
BETH19	0.09	3.58	2.52
BETH23	0.06	1.9733	2.85

Preliminary Results – Nest Survival

Nest success by landowner types

Outcome	State	BLM	Private	Total
Success	2	4	6	12
Failure	10	5	3	18
Total	12	9	9	30
% Success	16.7%	44.5%	66.7%	40%

Juvenile Survival

Hypothesis – Juvenile Survival

- Survival
  - Vegetation Cover
  - Food availability
  - Habitat heterogeneity
  - Presence of Curve-billed Thrasher
- Movement Patterns
  - Exposure
  - Frequency
  - Presence of Curve-billed Thrasher

Methods – Juvenile Survival

Radio transmitter attachment

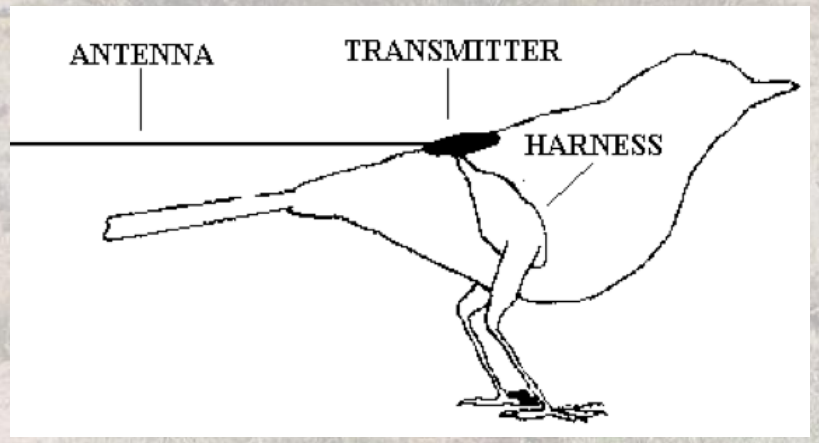
Tracking every day or

every other day

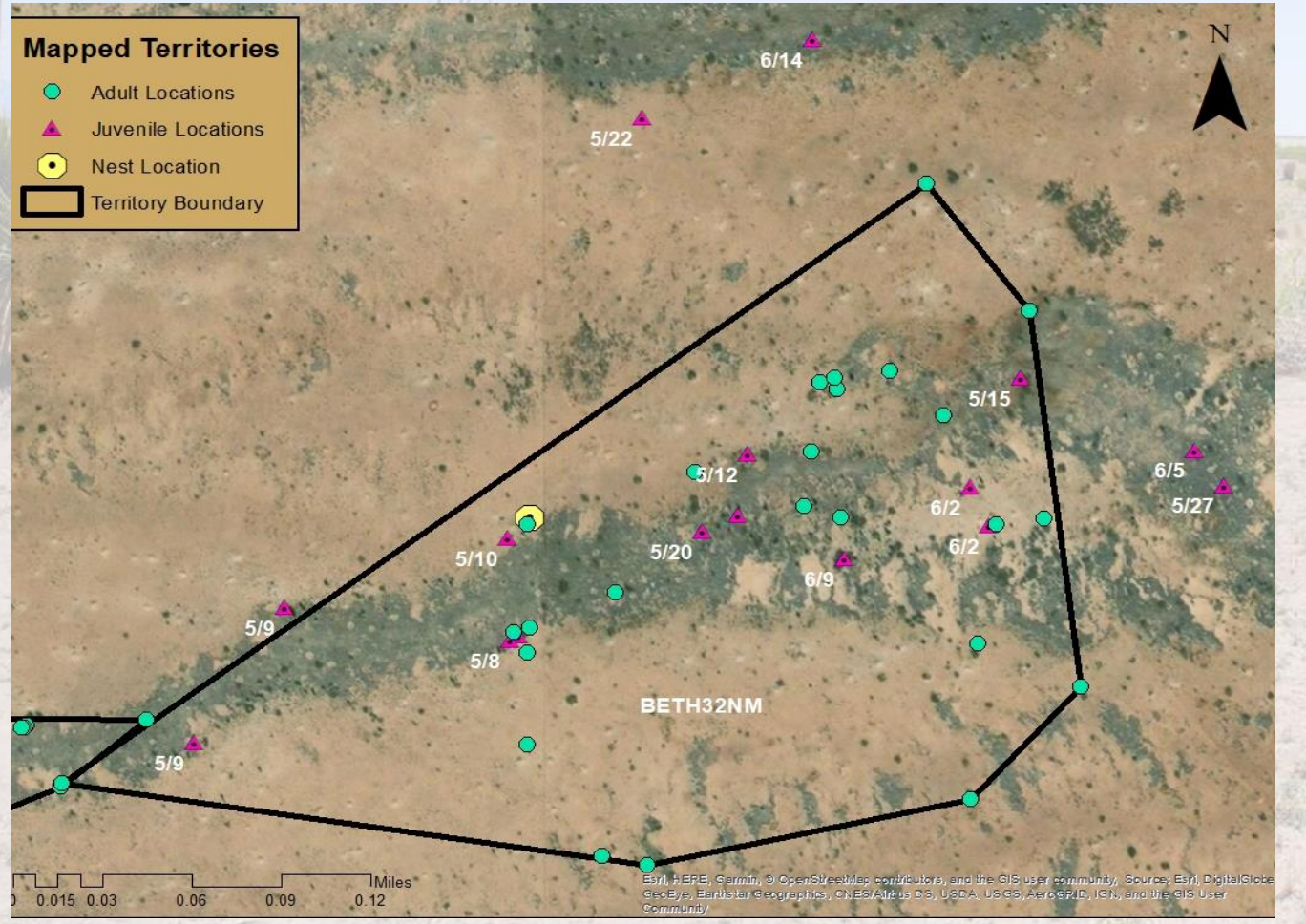
Insect collection

Vegetation data collection

Point-count surveys



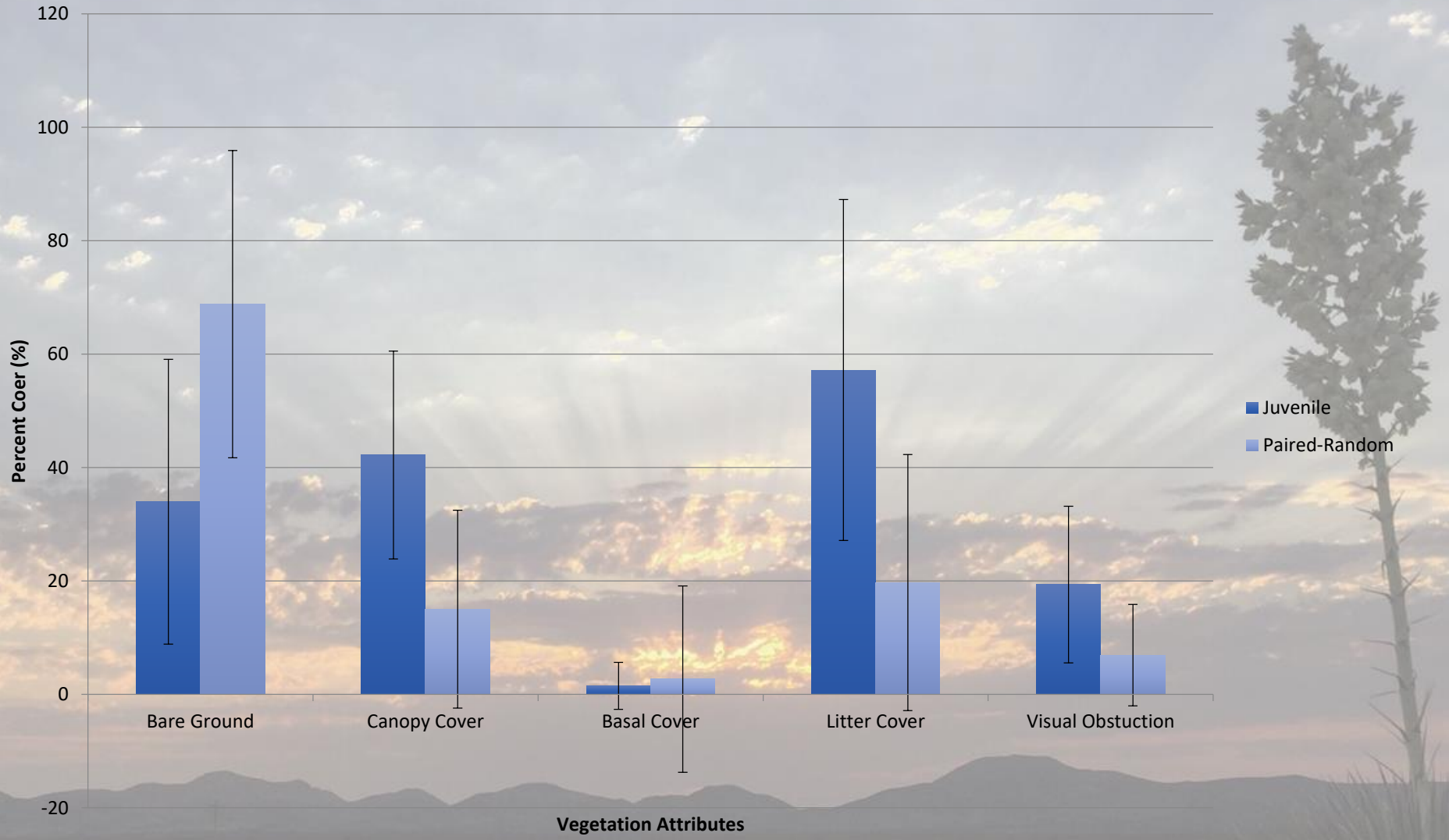
Preliminary Results – Juvenile Survival



Length (days) of known survival for post-fledgling Bendire's Thrashers

	$\bar{X}$	SD
All Transmitter Juveniles	14.78	13.02
Known Surviving (n=4)	27.25	7.37
Mortality (n=5)	4.8	4.27

Preliminary Results – Juvenile Survival



Future Analysis

2019 Field season -> increase sample size of nest

Territory scale analysis

Landscape scale analysis

Climatic variables

- **Temperature**
- **Bioyear precipitation**

Acknowledgements

- Share with Wildlife
- New Mexico Game and Fish
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Questions