Management Plan for the improvement of Bobwhite Quail(*Colinus virginianus) Habitat*
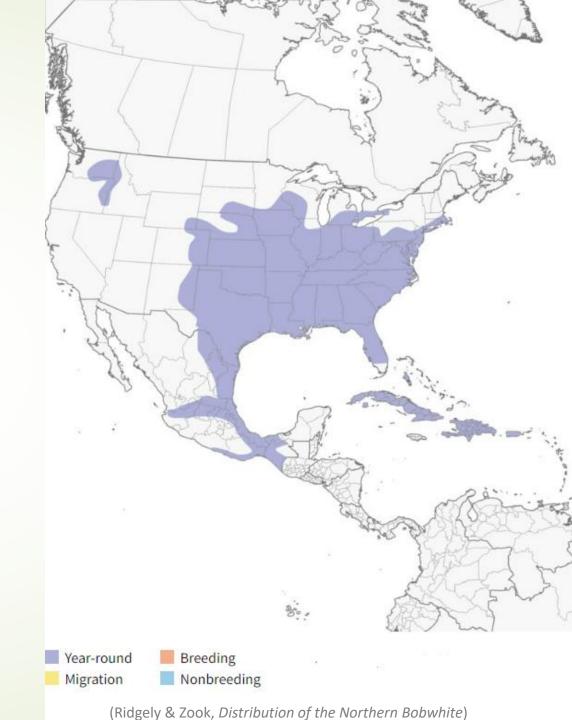
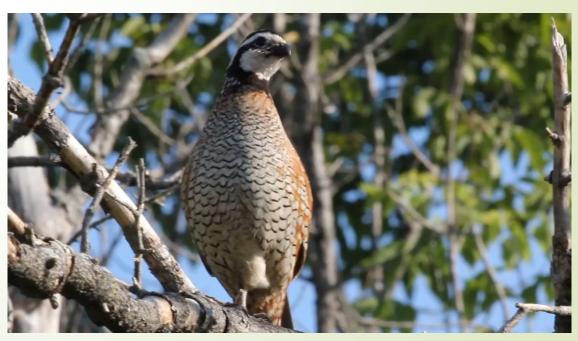Aliyah Abdur-Razzaaq

(Bryan Knowles, Bobwhite Quail)

Introduction

❑ Northern Bobwhite is a species of quail native to the United States.

❑ Over the last 35 years in bobwhite populations have declined by more than 75% in Texas

❑ Potential causes of decline: drought, land use changes, land fragmentation, habitat loss, invasive species, insecticides, diseases and parasites.

Year-round
Migration
Breeding
Nonbreeding

(Ridgely & Zook, *Distribution of the Northern Bobwhite*)

Habitat/Lifestyle

- Agricultural fields, grasslands, pine forests, and grass-brush rangelands.
- Open ground cover ~30% to 50% vegetative coverage.
- Avoid mature woodlands and prefer the early stages of woody regrowth after a fire or other disturbance
- Prefer places with access to water
- Ground Nesters
  - Mainly nest in bunchgrasses
- Winter/Fall Diet mainly seeds
  - Forbs and grasses
- Spring/Summer Diet mainly insects and plant mast

(Ivanov, *Northern Bobwhite Quail*)

Objectives

To be implemented after comparison between Savanna C North and Savanna D South. The location most suitable for the following objectives will be chosen.

1. Monitoring the population of little bluestem once per year to ensure frequency does not decrease by more than 25%.

2. Increase bare ground cover from current measurement to 30%
   a. To be implemented via controlled burns and cattle grazing
   b. Sampling for cover of bare ground to occur once per year

Site Descriptions

Savanna C North

- Located in Ecoregion 3 Post oak Savannah .

- Open grassland containing a small pond. Soil is majority composed of Boonville fine sandy loam (70+%)

- High Runoff class

- Last burn treatment march 2018

Savanna D South

- Located in Ecoregion 3 Post oak Savannah .

- Forested area containing a small pond.

- Soil composed of Zack fine sandy loam (100%)

- High Runoff Class

- Last burn treatment April 2018

Methods: Sampling

Savanna C North

Frequency

- Mixture of Line Intercept and Random Quadrats(60 total)
- Total hits measure
- .25m^2 frame used

Cover

- Random Quadrats
- Percent cover measured
- .25m^2 frame used

Savanna D South

Frequency

- Mixture of Line Intercept and Random Quadrats (60 total)
- Total hits measured
- .25m^2 frame used

Cover

- Point Intercept
- Number of hits measured
- Stake/Flag used

Methods: Analysis

- Each method is compared with an error rate of .05%

- Frequency of little bluestem Savanna C North and Savanna D south compared using chi-square analysis.

- Frequency of trees/shurbs in Savanna C North and Savanna D south compared using chi-square analysis.

- Cover unable to be compared directly due to different sampling methods. Instead:

    - Cover in Savanna C North compared to the ideal mean using a single sample T-test

    - Cover in Savanna D south compared to the ideal number of hits using chi-square analysis.

Results

➤ Little bluestem chi-square

- Null Hypothesis: Both plots of land contain the same amount of little bluestem

- Alternative: Savanna D south contains more little bluestem than Savanna C north

Critical value: 3.84
Significance level: .05
P value: . 007244
Null Hypothesis rejected

Savanna C North		
name	hits	percent
ANTR	2	3.33%
BULA	1	1.67%
CAIN	1	1.67%
CYPER	1	1.67%
DIOL	4	6.67%
ERCA	1	1.67%
EUPAT	5	8.33%
ILVO	5	8.33%
LALIPO	1	1.67%
NALE	3	5.00%
NOST	1	1.67%
PAPL	2	3.33%
RUTR	13	21.67%
SCSC	47	78.33%
SMILA	1	1.67%
SPCR	1	1.67%
ULCR	1	1.67%
ULMUS	1	1.67%
VERBI	3	5.00%
VISCI	1	1.67%
YUCCA	1	1.67%
TOTAL	47	

Savanna D south		
name	Number of hits	percent
ANTE	1	1.67%
BAPTI	3	5.00%
BOTHR	2	3.33%
CLOVER	1	1.67%
CRTE	1	1.67%
ILVO	1	1.67%
JUVI	1	1.67%
LUTE	1	1.67%
NALE	6	10.00%
NOBI	11	18.33%
OPUNT	1	1.67%
PAFL	2	3.33%
QUST	2	3.33%
RUTR	2	3.33%
SCSC	57	95.00%
TOTAL	57	

Results con't

➡ Tree/Forb chi-square

- Null Hypothesis: Both plots of land contain the same amount of Trees & shrubs

- Alternative: Savanna C North contains Trees/Shrubs than Savanna D south

Critical value: 3.84
Significance level: .05
P value: .004485
Null Hypothesis rejected

Savanna C North

name	hits	percent
ANTR	2	3.33%
BULA	1	1.67%
CAIN	1	1.67%
CYPER	1	1.67%
DIOL	4	6.67%
ERCA	1	1.67%
EUPAT	5	8.33%
ILVO	5	8.33%
LALIPO	1	1.67%
NALE	3	5.00%
NOST	1	1.67%
PAPL	2	3.33%
RUTR	13	21.67%
SCSC	47	78.33%
SMILA	1	1.67%
SPCR	1	1.67%
ULCR	1	1.67%
ULMUS	1	1.67%
VERBI	3	5.00%
VISCI	1	1.67%
YUCCA	1	1.67%
TOTAL	**20**	

Savanna D south

name	Number of hits	percent
ANTE	1	1.67%
BAPTI	3	5.00%
BOTHR	2	3.33%
CLOVER	1	1.67%
CRTE	1	1.67%
ILVO	1	1.67%
JUVI	1	1.67%
LUTE	1	1.67%
NALE	6	10.00%
NOBI	11	18.33%
OPUNT	1	1.67%
PAFL	2	3.33%
QUST	2	3.33%
RUTR	2	3.33%
SCSC	57	95.00%
TOTAL	**7**	

Cover chi-square

Cover Classification	Amount Counted	Total Amount Possible
Bare Ground	9	
Litter	5	
Grass	12	
Forb	1	
Woody	2	29
IDEAL bare ground	15	

- Null Hypothesis: Savanna D south has the same amount of bare ground cover as the Ideal.

- Alternative: The ideal contains more bare ground cover than Savanna D south.

Critical value: 3.84
Significance level: .05
P value: .109682

Fail to Reject Null Hypothesis

Cover single sample T-test

Mean	4.3
standard deviation	6.447221624
Variance	41.56666667
Observations	10
SEM	2.038790491
hypothesized mean (ideal)	50
df	9

- Null Hypothesis: Savanna C North has the same amount of bare ground cover as the Ideal.

- Alternative: The ideal contains more bare ground cover than Savanna C North.

Alpha level 0.05
t Stat -22.41525071
t dist 0.00000000331460525

Null Hypothesis Rejected

Implications & Actions

- Savanna C North

- Contains less little bluestem

- Contains more trees/shrubs

- Contains less bare ground than the Ideal.

- Savanna D South

- Contains more little Bluestem

- Contains less tree/shrubs

- Same amount of Bare ground as Ideal

For monitoring purposes Savanna D south would be more ideal to implement controlled burn and management of little bluestem than Savanna C North. Starting with a baseline of more little bluestem will make it easier to prevent a decline of over 25%. However, it is important to note point intercept is not the best metric to measure cover. This may have influenced the results.

Budget & Timeline

- Estimated timeline approx.~ 5 years.

- Budgeted to reflect 4 people monitoring for 2 weeks(1 week before burn and 1 week after 6 months)

- Cattle Costs accounts for 1 week of grazing.

	Cost
Controlled burn	1914$
Personell	800$
Equipment	2000$
Monitoring	38,400
cattle	2380$
Total	45,494$

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