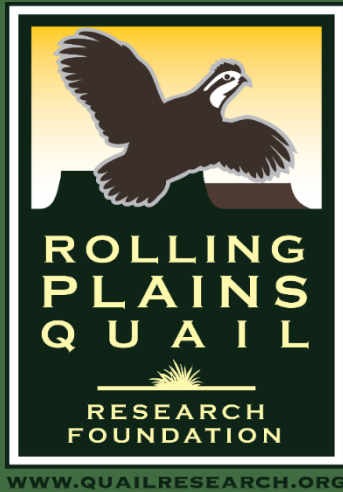


EFFICACY OF A SOFT RELEASE STRATEGY FOR TRANSLOCATING SCALED QUAIL IN THE ROLLING PLAINS OF TEXAS



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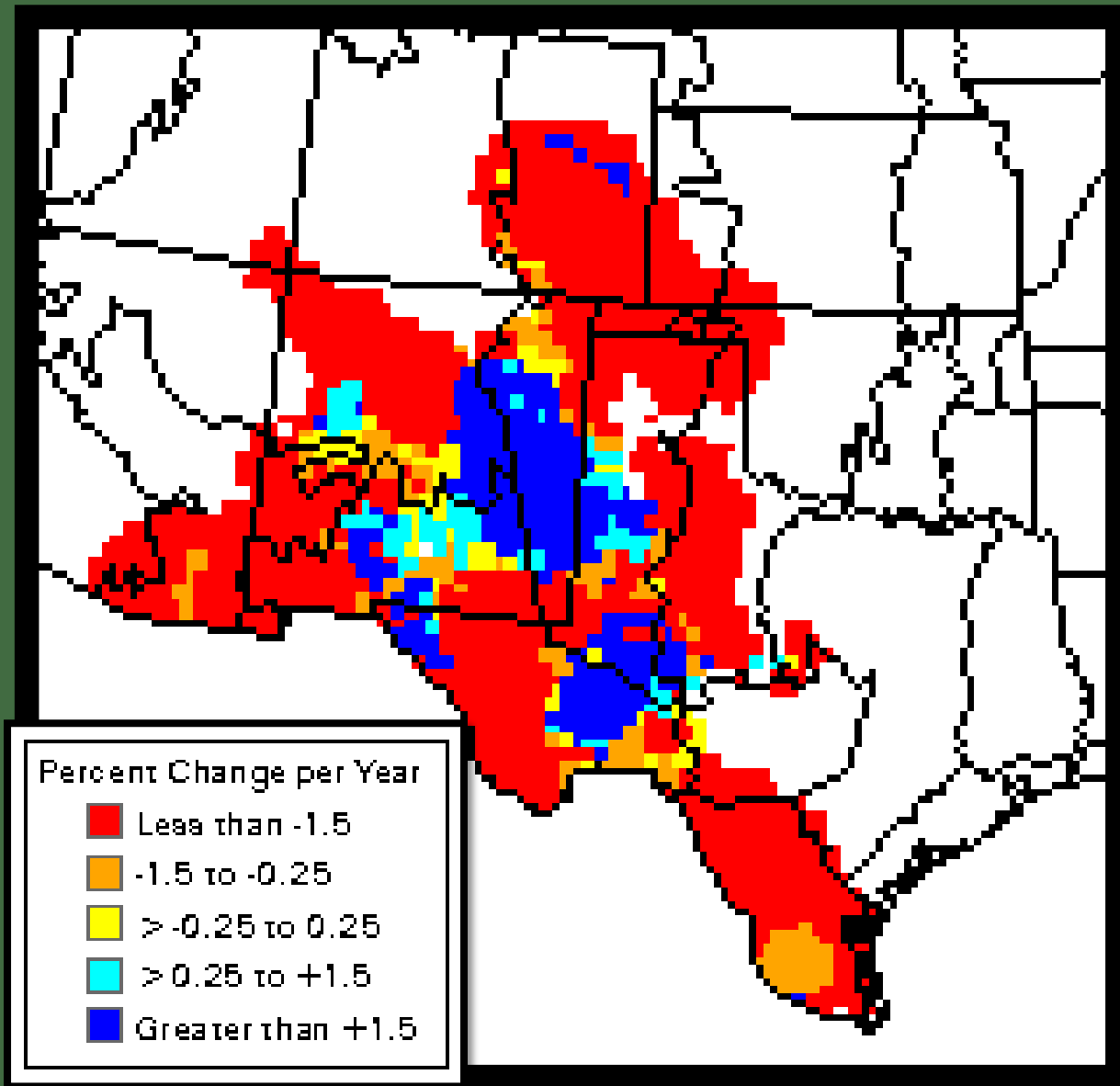
Michelle Downey, Bradley Kubecka, Dale Rollins

Rolling Plains Quail Research Foundation, Roby, Texas

Kara Campbell, Matthew Poole, Donald Ruthven

Matador Wildlife Management Area, Texas Parks and Wildlife Department, Paducah, Texas

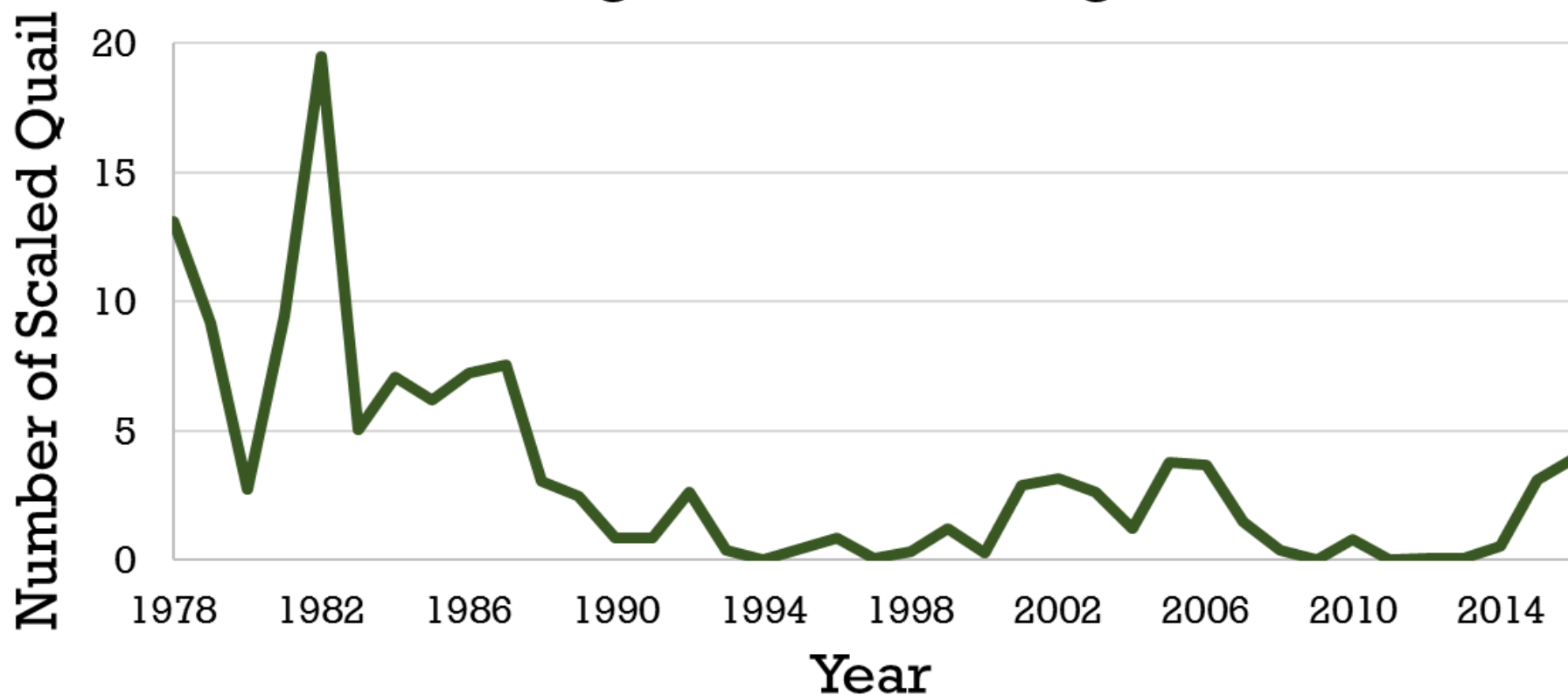
TRENDS IN TEXAS



- Overall decline
- Range contraction
- 7% per year

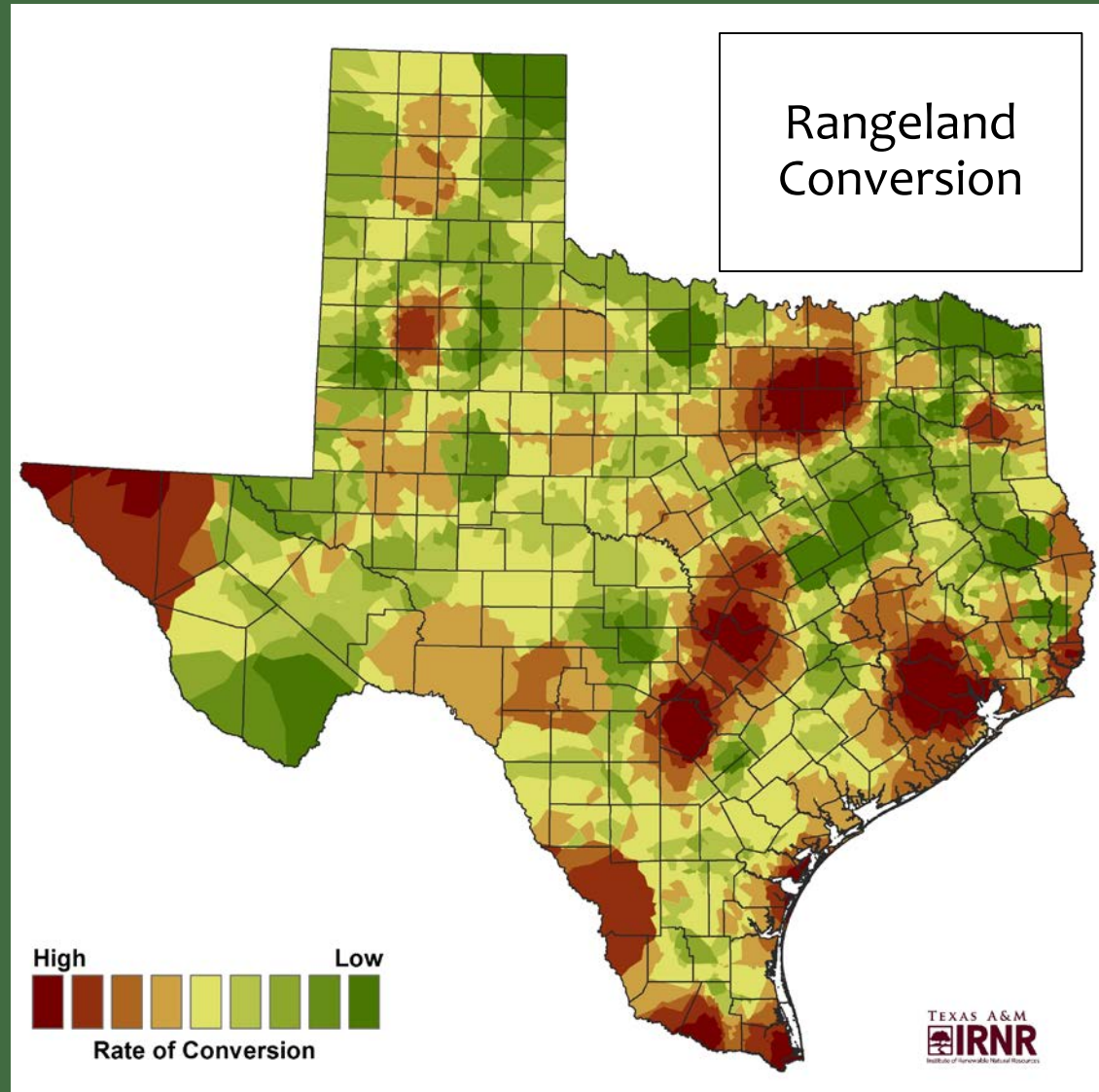
1966-2013
Breeding Bird
Survey

Texas Parks and Wildlife Department Quail Forecast Rolling Plains Ecoregion



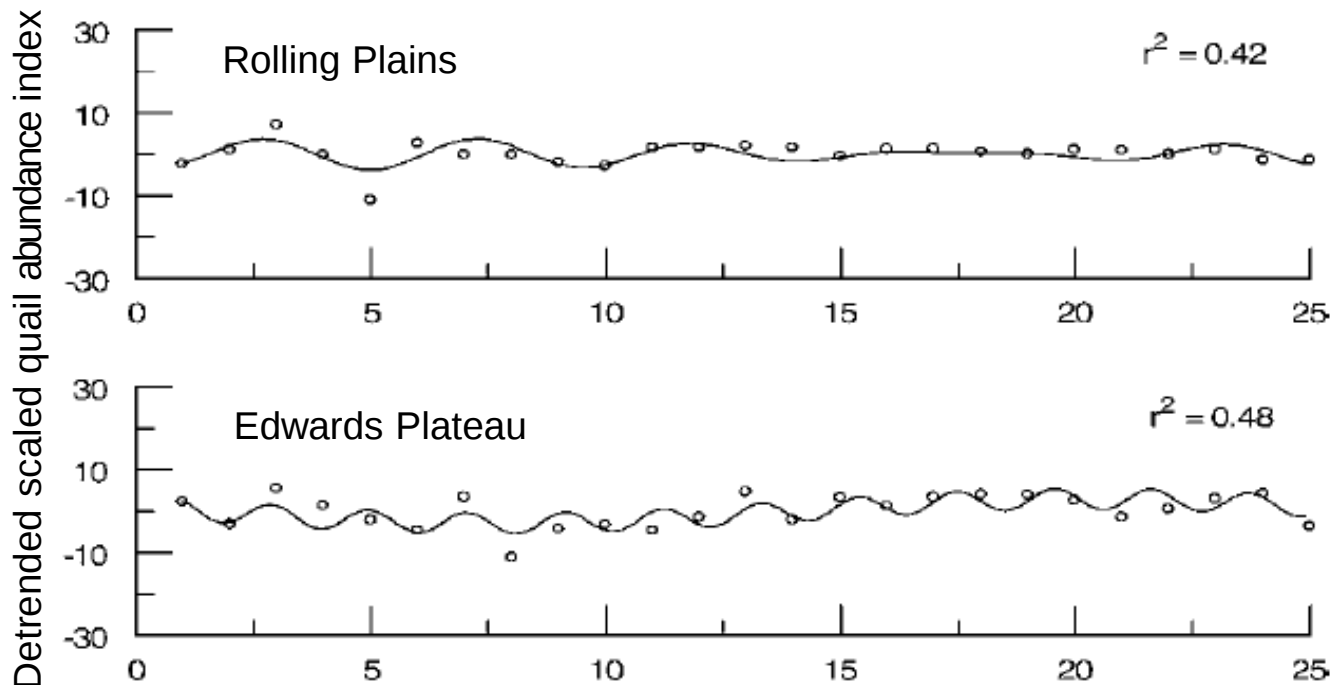
ULTIMATE CAUSES

- Habitat fragmentation (Rho et al. 2015)
 - Increase in woody cover
 - Increase in spatial aggregation of cropland
- Drought (Bridges et al. 2002)



POPULATION IMPACTS

- Reduced recolonization
 - Capable of long distance dispersal
 - Inhibited by unsuitable habitat
- Low density
 - Loss of 'boom and bust' cycles
 - Remnant populations decline without influx of new individuals



Cyclic components
of scaled quail
dynamics in Texas
ecoregions based
on TPWD counts.

1978 – 2002

Lusk et al. 2007

TRANSLOCATION AS A TOOL

- Reestablish historic populations
- Supplement remnant populations
- Long history of translocation
 - Bobwhite
 - Grouse
 - Prairie Chickens
 - Turkeys



Goal: improve effectiveness of translocation as a tool to reestablish scaled quail within the Rolling Plains by researching best practices.

RELEASE STRATEGY

- Impacts translocation success
- Species specific
- Hard vs. soft release
 - Hard release more commonly used
 - Social species with small home ranges may benefit from soft release (Moseby et al. 2014)
 - Quail translocations have employed both hard and soft release



OBJECTIVES

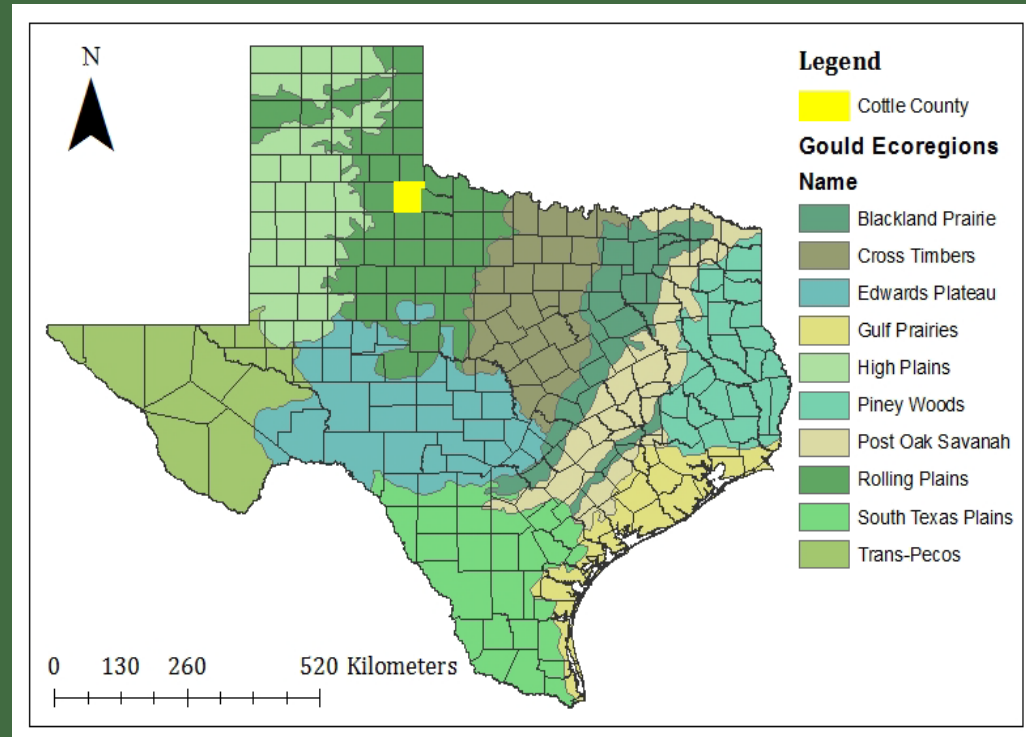
- Hard vs. soft release
 - Previous unsuccessful translocations used hard release
 - RPQRR translocation successful using soft release
 - No studies have directly compared release strategy



Objective: compare survival and dispersal between two release treatment groups: hard and 4-week soft release

MATADOR WMA STUDY SITE

- State-owned and managed for wildlife: 1959
- 11,000 HA
- Predominately sandy soil with rough broken land drainages
- Dominant woody cover: mesquite, juniper, sand sage, and shinnery oak
- Scaled quail present until circa 2000



FIELD METHODS

- Source:
 - Wild-caught
 - 3 locations: private and public lands
 - Edwards Plateau and High Plains
- Wire walk-in traps
- Age, sex, weigh, leg band, and genetic samples
- Radio-marked hens
- Transported to release site <24 hrs



FIELD METHODS

- 3 release sites on study area
- Randomly assigned treatment groups
 - 12 – 15 quail per group
 - Hard release: immediate
 - Soft release: Surrogator © for 3-4 weeks, released April 22 2014



FIELD METHODS

- Telemetry monitoring
 - Daily survival and locations post-release
 - Interval
 - Hard release: Mar - Aug, 159 days
 - Soft release: Apr - Aug, 125 days
 - Fixed wing surveys to locate missing hens



DATA ANALYSIS

- Uneven monitoring intervals
 - Rough terrain and long dispersal distances
 - Detection < 1
- Open population capture-recapture
 - Cormack-Jolly-Seber (CJS) model Program MARK
 - Encounter history
 - Observed live = 1
 - Not observed/observed dead = 0
 - Parameters
 - Detection probability (p)
 - Daily apparent survival rate (DASR): probability that hen survives and does not emigrate



DATA ANALYSIS

Table 1. Covariates used to model parameters in CJS models

Parameter	Covariate	Hypothesis
DASR	Release treatment (hard vs. soft)	↑ soft release
	Age (adult vs. juvenile)	No effect; ↑ adults
	Time trend	↑ over time
p	Dispersal (low vs. high)	---

- All possible combinations
- AICc to rank models
- 80% confidence intervals of beta estimates to identify uninformative parameters (Arnold 2010)

RESULTS

- 88 total quail trapped and released
 - 40 radio-marked hens
 - 47 males
 - 1 unknown juvenile
- Dispersal
 - 0.5 – 22 km
 - 85% dispersed >2 km
 - 30% dispersed >10 km
- 13 hens permanently missing
 - 10 hard release, 3 soft release

Table 2. Sample sizes of radio-marked hens per treatment group

	Adult	Juvenile
Soft release	4	14
Hard release	5	17

RESULTS

Table 3. Truncated candidate model set.

Model	AICc	Δ AICc	AICc Weight	k
ϕ (age + release), p (group)	1462.425	0	0.23089	5
ϕ (T), p (group)	1462.76	0.3411	0.19469	4
ϕ (release + T), p (group)	1462.84	0.4179	0.18735	5
ϕ (age + release + T) , p (group)	1463.04	0.6192	0.16941	6
ϕ (age + T), p (group)	1463.89	1.4711	0.11065	5
ϕ (release), p (group)	1464.04	1.6193	0.10275	4
ϕ (.), p (.)	1507.85	45.425	0	2

RESULTS

- Covariate effects on DASR
 - Time trend (T) was uninformative
 - Age and release
 - Soft > hard release
 - Adults > juveniles



Table 4. Estimates of DASR.

Release Strategy	Age	DASR	SE	120 day interval
Hard	Juvenile	0.95	0.01	<0.01
	Adult	0.97	0.01	0.03
Soft	Juvenile	0.98	<0.01	0.09
	Adult	0.99	<0.01	0.30

DISCUSSION

- Overall DASR low compared to estimates of resident true survival
 - But, DASR includes emigration
 - Published true survival: 0.22 – 0.8
 - 3 of 4 estimates < 0.1
 - **Exception: adult, soft release hens**
 - Release treatment had largest effect
- Dispersal distance high
 - Typical home range: 0.3 – 1.2 km²
 - 2 long distance moves > 20 km
 - Biased low
 - **10 of 22 hard released hens went missing**



MANAGEMENT IMPLICATIONS

- Soft release strategy may be advantageous
 - ↑ in DASR and ↓ exposure time
 - Other quails and gallinaceous birds
 - Mountain quail: 3-4 months (Stephenson et al. 2011)
 - Bobwhite quail: 7 days (Scott et al. 2013)
 - Sharptail grouse: 10 weeks (Rodgers 1992)
- Select for higher proportion of adults





WWW.QUAILRESEARCH.ORG

Questions?

TEXAS
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