



Corona mule deer, pronghorn, and livestock co-management project

L. C. Bender, J. Boren, & S. Cox

New Mexico Cooperative Fish and Wildlife Research Unit, Cooperative Extension Service, & Corona Livestock and Range Research Center



Ungulate Population Dynamics

A population's rate-of-increase (λ) is driven by:

1. Adult female survival (S_F)
2. Production and survival of juveniles (productivity)

$$\lambda = S_F + \frac{1}{2} * J:F_{Apr}$$

CORONA: 2006

	S_F	J/F	λ	What may happen?
Deer	0.47	0.22	0.64	Decline $\geq 42\%$
Pronghorn	0.64	0.18	0.73	Decline $\geq 27\%$



Condition, survival, & habitat use of sympatric deer, pronghorn, and cattle

Methods

1. Capture & radio-collaring
 1. Determine survival and causes of mortality
2. Determine nutritional condition
 1. Model effects on survival = logistic regression
3. Determine effects of habitat on condition
 1. Model effects of precipitation and home range attributes on doe condition = logistic regression
 2. Compare temporal and spatial co-use of cattle and deer and model effects on condition of deer
4. Estimate population size, productivity, & trends



Health, condition, & causes of mortality

Health & condition

	Deer		Pronghorn	
	Doe	Buck	Doe	Buck
Fat (cm)	0.18	0.56**	0.86 cm	1.07 cm
% IFBF	6.93	---	---	---
rBCS	2.13	2.80*	2.86	3.16*
wBCS	3.28	3.70	3.80	3.88
Loin (cm)	3.68	4.10**	3.40	3.77**
Girth (cm)	87	100**	92 cm	92 cm

Low fat levels of does = very poor survival ----->
Lactating does = 5.6% body fat: lowest levels documented in NM
IFBF of 6.8% resulted in a 36% decline in deer in northcentral NM

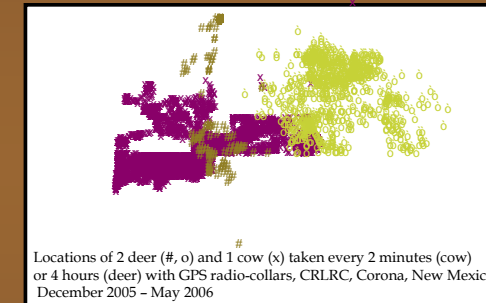
Causes of mortality

Cause	Deer		Pronghorn	
	Doe	Buck	Doe	Buck
Malnutrition	0.46	0.25	0.00	0.11
Predation	0.07	0.00	0.00	0.00
Disease	0.00	0.00	0.36	0.00
Illegal kill	0.00	0.00	0.00	0.00
Accident	0.00	0.00	0.00	0.00
Unknown	0.00	0.00	0.00	0.00
Total	0.53	0.25	0.36	0.11
Survival	0.47	0.75	0.64	0.89

Habitat use on shared ranges

Livestock & wildlife

- GPS telemetry to compare spatial and temporal-spatial use by cattle and mule deer
- Model effects on deer condition and survival



Population size & productivity

Aerial surveys flown annually in April, 2005-2006

- Deer population declined 26% from April 2005 to April 2006
 - Extreme poor body condition (5.6% body fat) =
 - Low productivity
 - Poor survival
- Pronghorn population much more stable
 - Condition of pronghorn better than deer

Habitat	Population demographics	
	2005	2006
Deer		
Population size	539	397
Fawn/doe ratio	0.45	0.29
Pronghorn		
Count	136	126
Buck/doe ratio	0.75	0.40

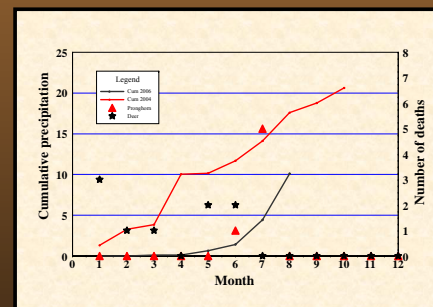
Mule deer population size derived from a sightability adjusted estimator
Pronghorn population estimates are minimum counts

Predation



- Capture and radio-collar every adult coyote on Corona
- Assess food habits through fecal analysis
- Determine specific individuals responsible for livestock and wildlife kills through telemetry and GC analysis of odorants
 - Is ungulate predation a population or individual phenomenon?
 - Is broad-scale control an effective antipredation strategy?
- Compare condition of kills v. surviving ungulates
 - Are kills less viable?
 - Are parents of kills in poorer condition?

Precipitation



Effects of precipitation

- Increases forage quantity & quality
- Increases maternal condition (doe body fat)
- Leads to larger fawns born earlier

