



Factors Influencing Water Consumption by White-tailed Deer

J. Hunter Brooks

Charles A. DeYoung, Timothy E. Fulbright,
David G. Hewitt, Kim N. Echols, Don A. Draeger,
David B. Wester

Why is water important?

Physiological significance

- Metabolic body functions
- Waste excretion
- Thermoregulation
- Solvent for nutrients/vitamins
- Gestation, lactation, growth



Background

- Water development for wildlife
- Lack of surface water = limiting factor
- Drought years can cause large fluctuations in ungulate populations



Sources of Water

- Free water
 - Standing water from rain
 - Natural streams/ponds
 - Water troughs
- Preformed water
 - Water from vegetation
- Metabolic water
 - Breakdown of fats, carbs, protein in food



Water Location

- Due to low water content of protein feed, water troughs are often placed in close proximity to feeders



Diet Composition

- Providing supplemental feed theoretically increases free water requirement due to decrease in preformed water
- Proportion of feed in the diet can strongly influence free water requirement

Percent dry feed:browse	Browse (pounds)	Preformed water (Gallons) (browse/2)	Free water requirement daily (Gallons)	% increase in free water needed daily
0:100	6.90	0.42	0.42	
25:75	5.24	0.50	0.53	26%
50:50	3.49	0.21	0.63	19%
75:25	1.75	0.10	0.74	17%
100:0	0	0	0.84	14%

Past research

- How often animals visit
- Which animals visit
- Mostly in desert habitats
- Some captive studies address amount



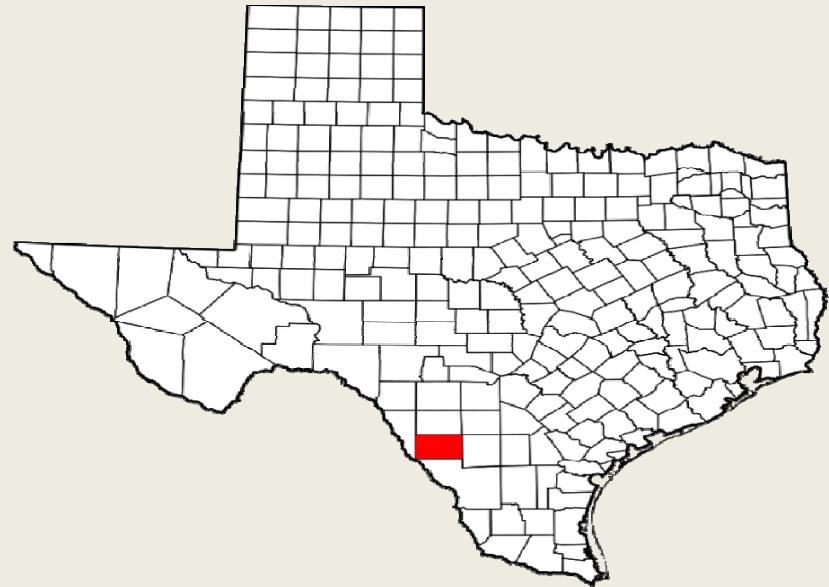
Objectives

- How do age, season, and deer density affect water consumption by white-tailed deer?



Study Area

- Comanche and Faith Ranches
- Dimmit County, TX



South Texas Climate

- Highly variable in temperature and precipitation
- Average 54.6 cm rainfall (>30% coefficient of variation)



February 2015



April 2015



June 2015

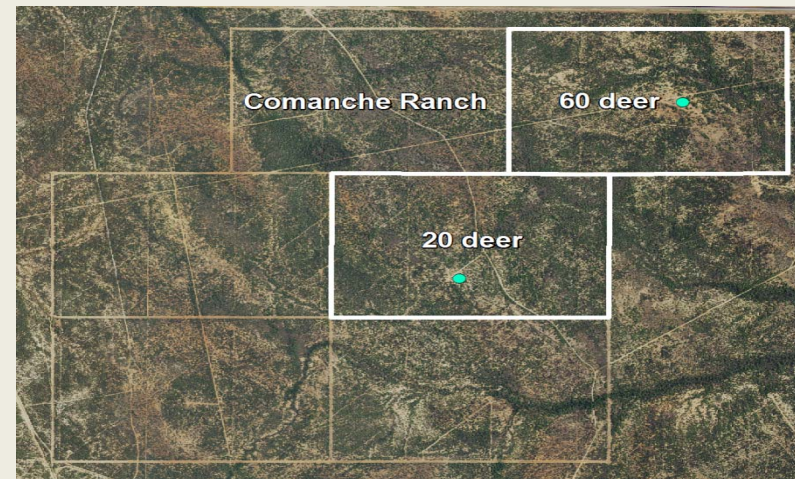


October 2015



Study Area

- 2- 200 acre enclosures on each ranch
- 1 enclosure with 20 deer (10 acres per deer)
- 1 enclosure with 60 deer (3.3 acres per deer)
- REAL densities, NOT helicopter survey
- 1 water trough per enclosure and 1 supplemental feeder



Sources of Drinking Water

- Faith Ranch
 - Water is pumped into troughs from a well
- Comanche Ranch
 - Water is pumped into troughs from a manmade pond
- Water quality tests were performed, no limiting factors found

Methods

- Cover existing trough with plywood
- Reconyx® Ultrafire cameras
- A&A Scales Livestock Scale Kit





Methods

- Scales don't always work
- Estimation method
- Amount consumed per second (consumption rate)



Timeline

- Data included in presentation analysis:
 - January 2015 to August 1, 2015

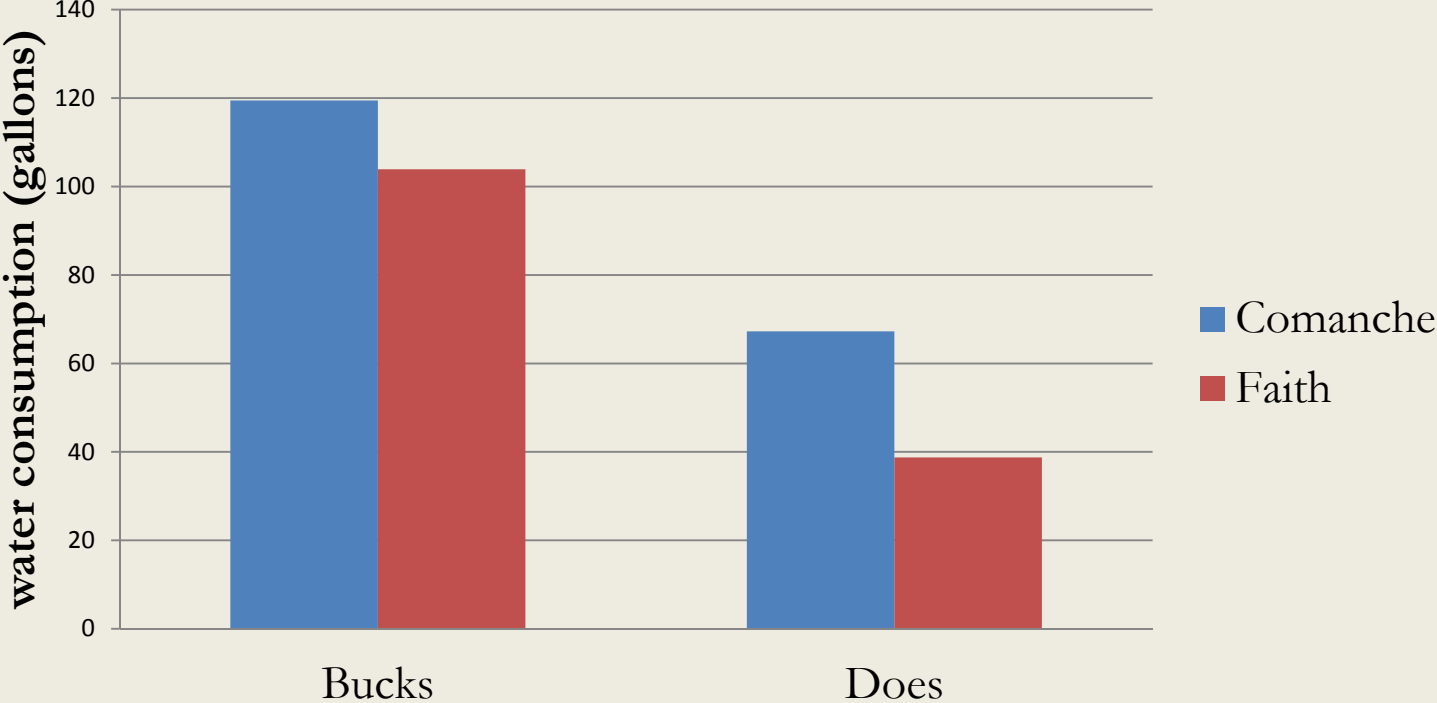
Individual Variation

- White 70
 - 261 visits to the water trough

- White 44
 - 3 visits to the water trough



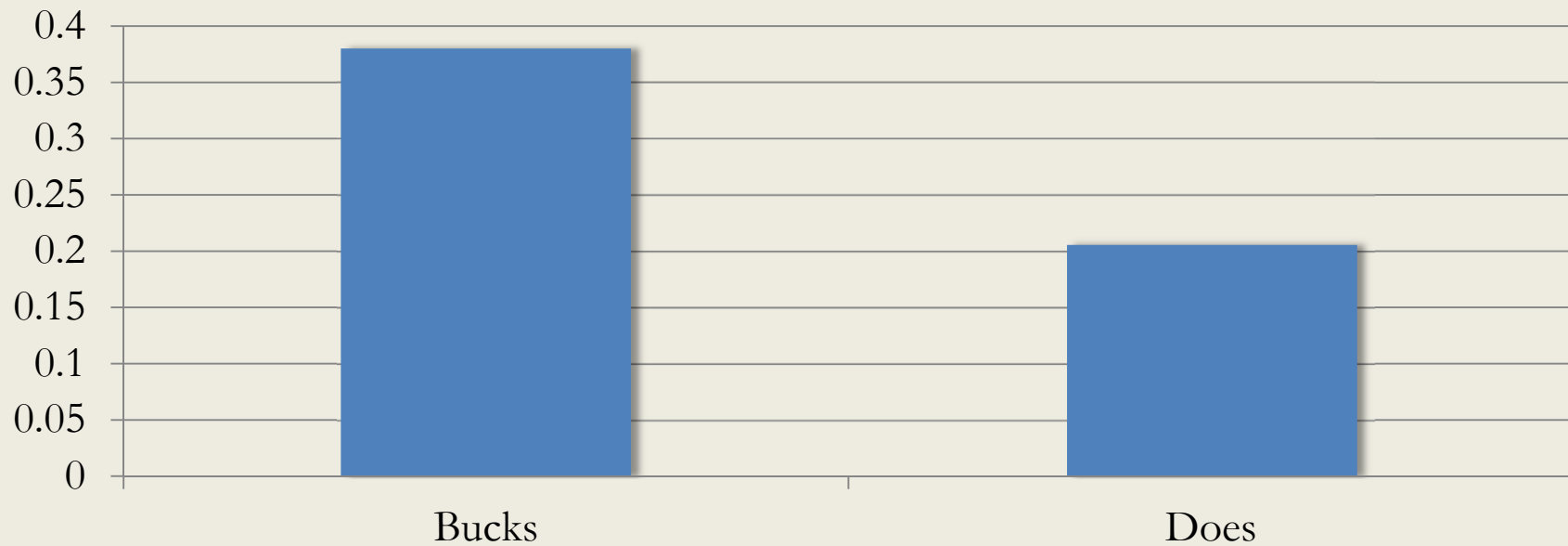
Water consumption by ranch



Consumption

Mean Water Consumption

Gallons/week



Age Classes

Age classes:

1.5-3.5 years old

4.5-5.5 years old

6.5+ years old

- 40 deer
- 5 bucks and 5 does per enclosure

	1.5-3.5	4.5 to 5.5	6.5+
High density	6 deer	3 deer	11 deer
Low density	6 deer	5 deer	9 deer

Analysis

Needed to be sure that deer of each sex and age group were visiting with the same frequency

- No statistical significance found
- Gallons/visit is representative of overall consumption

Analysis

- **Test the effect of deer density on water consumption across 3 age classes**

Results

- Deer density did not affect consumption in bucks younger than 6.5
- Deer density did not affect consumption in does younger than 6.5
- 6.5 year old+ bucks drank significantly more in the high density enclosure
- 6.5 year old + does drank significantly less in high density enclosure

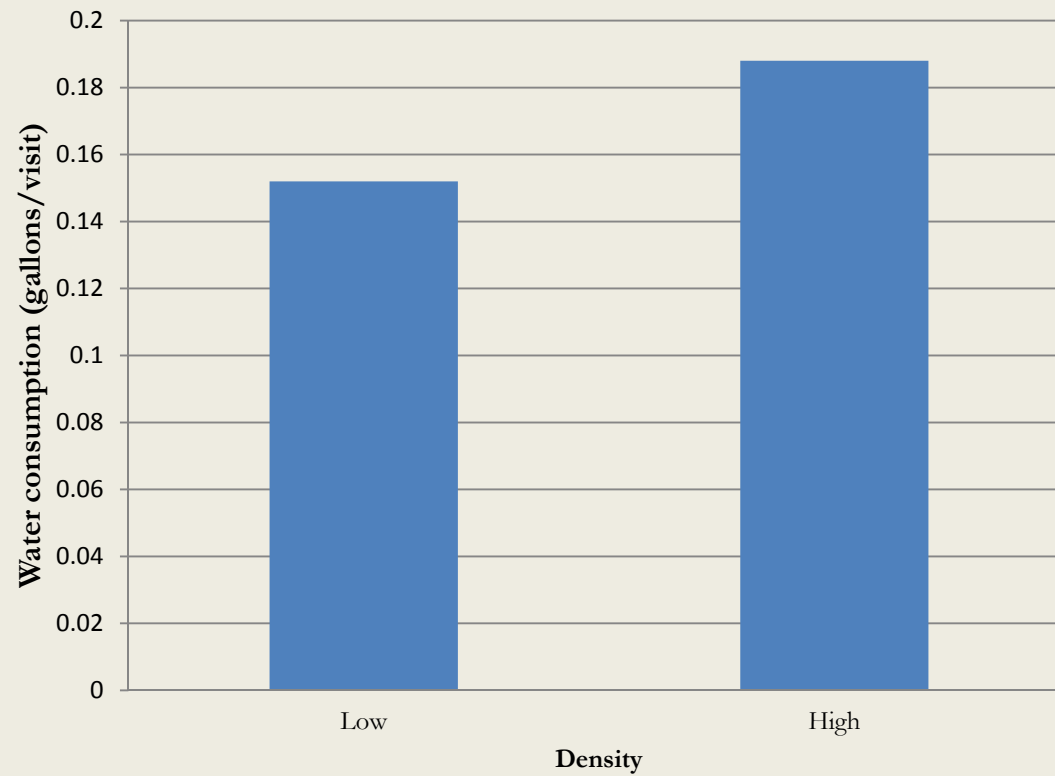
Results

Consumption by Density for 6.5+ does



Results

Consumption by Density for 6.5+ bucks



Analysis

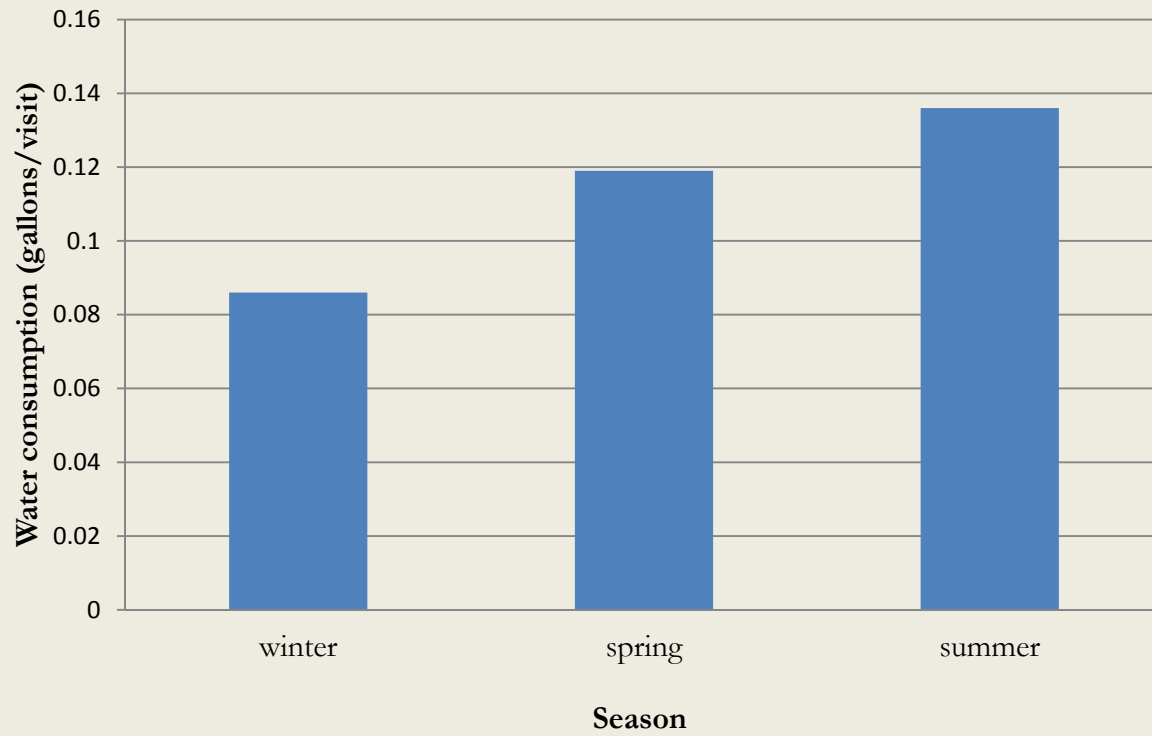
- **Test the effect of season on water consumption in 3 different age classes**

Results

- Season did not affect consumption in bucks of any age
- Season did not affect consumption in does younger than 6.5 years
- 6.5 year old+ does drank significantly more water during spring and summer

Results

Water consumption by season 6.5+ does



Discussion

- Does in lower density enclosure may be more productive than those in higher density
- Could bucks in higher density have increased competition for succulent vegetation which is a major source of water?
- Older does increase water consumption during gestation and lactation
- Bucks seem to overcome seasonal stresses in some way
- In each test, older deer seem to be more susceptible to environmental factors

Management Implications

- What is the take away for wildlife managers?
- Get water tested
- Water sources may be important when managing for older deer
- Water peaks in importance for does during gestation and lactation

Acknowledgements

Stuart Stedman and the Stedman West Foundation (major funding source)

T. Dan Friedkin (major funding source)

Dr. David Wester

Rene Barrientos

Fellow graduate students





