

White-tailed Deer Home Ranges: A comparison of the three phases of the rut

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Objectives

□ Purpose:

- To determine the effect of the rut on home range size of female white-tailed deer

□ Hypothesis:

- H_0 : Home range sizes of female white-tailed deer will not change during the pre, peak, and post rut phases
- H_a : Home range sizes of female white-tailed deer will decrease during the 3 week phase prior to the peak breeding phase of the rut.

Study Area



- Area: 275 acres
 - Includes 24 acre Lake Joanis
- Habitat types include:
 - Mixed hardwoods and conifers
 - Oak Savannah
 - Cattail marshes

Air Photo of Schmeckle Reserve



Methods

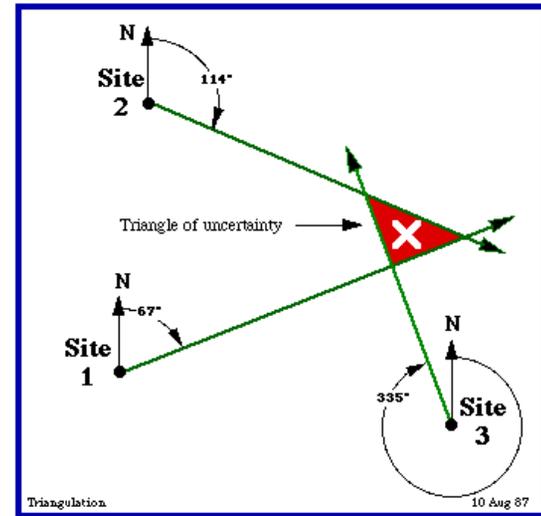
- Capture
 - Deer trapped using box traps baited with corn
 - Trapped February 2-23, 2005
 - 7 deer captured
 - 3 yearling does fit with radio collars. 1 mortality (June)
 - Collar frequencies: 151.172, 151.700 MHz



Methods

- Telemetry
 - locations found multiple times per day using hand-held receiver
 - a minimum of three telemetry stations
 - Bearings later used to triangulate deer location

- Dates: October 17 through December 2, 2005

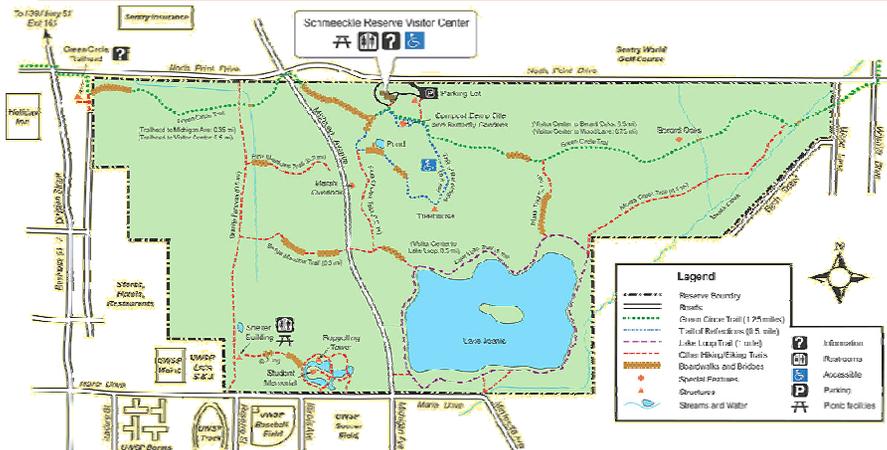


Analyses

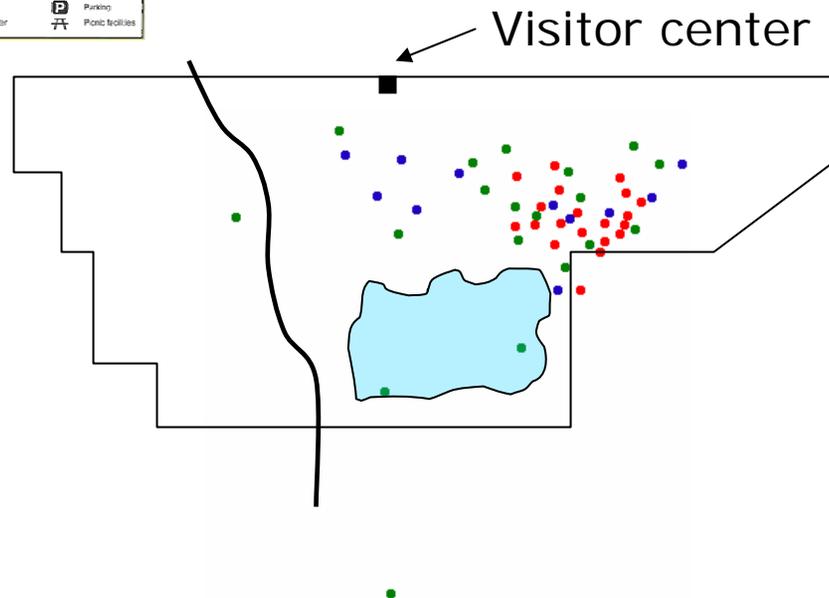
- Home range size – estimated by minimum convex polygon
 - Simplest and most common home range estimate
 - Minimum area estimate using outermost locations to form polygon
 - Found using *Locate 3*

- Paired T-test
 - Comparing home range size during pre and post-rut to the period of peak rut
 - Before and after measurements on the same sampling unit
 - Small sample size ($N < 30$)
 - Found using *SPSS*

Results: Deer 1.700 Locations

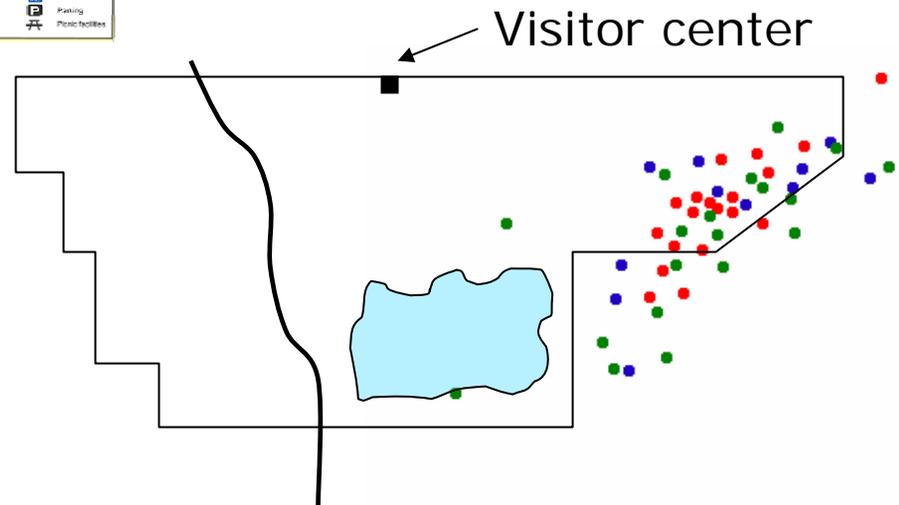
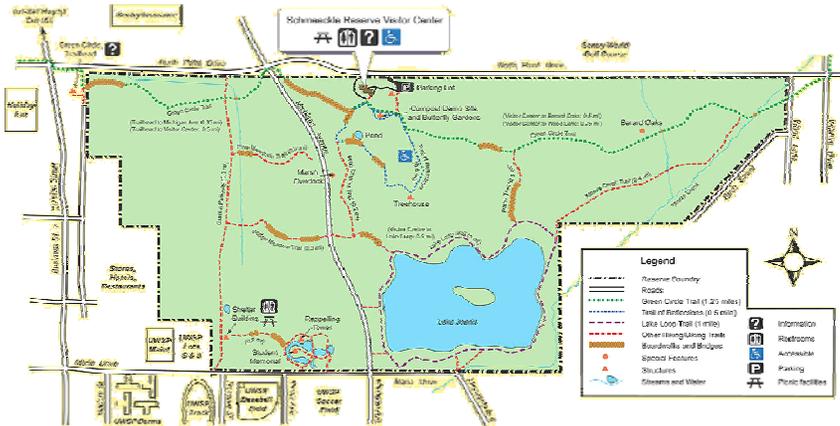


of locations/deer:
Pre Rut - 20
Rut - 21
Post Rut - 12



- Pre Rut (Oct 17-31)
- Rut (Nov 1-21)
- Post Rut (Nov 22-Dec 2)

Results: Deer 1.172 Locations



- Pre Rut (Oct 17-31)
- Rut (Nov 1-21)
- Post Rut (Nov 22-Dec 2)

Results: 1.700 Home range

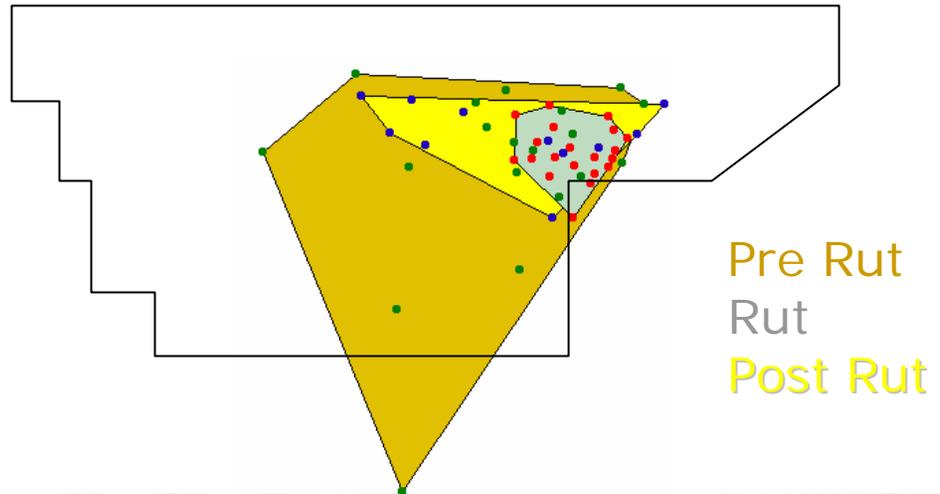
□ Home range size:

Pre Rut: 1,049,969 m²

*outlier locations

Rut: 99,543.5 m²

Post Rut: 239,866.5 m²



Results: 1.172 Home range

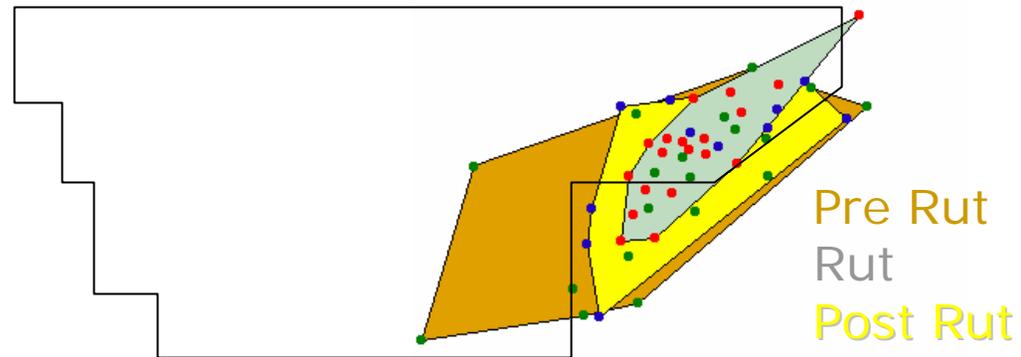
□ Home range size:

Pre Rut: 550,930.5 m²

*outlier locations

Rut: 141,925 m²

Post Rut: 270,662.5 m²



Home range Analysis

□ Paired T-test (both deer combined)

□ Pre Rut vs Rut (mean area)

$$p = 0.00 < 0.05$$

*Significant

Ho: Female white-tailed deer will show no significant change in home range size before, during and after the rut.

□ Rut vs Post Rut

$$p = 0.00 < 0.05$$

*Significant

Ha: Female white-tailed deer will show a significant change in home range size before, during and after the rut.

***Reject Ho**

Discussion

- Based on the results, the home range size of the female white-tailed deer we studied decreased during the 3 week phase prior to the breeding phase of the rut.
 - Assuming peak breeding fell between Nov. 14-21. Thus the 3 week phase we called the “rut” was Nov 1-21
 - *Exact date of estrous unknown
 - Affected by photoperiod, latitude, health of deer

Discussion

- Female home range sizes change during the phases of the rut
 - Natural or unnatural causes?
 - Does stay within core area during rut to allow bucks to find them easier
 - Pre rut area was influenced by several outlier locations which may not have been within the normal home range
 - Locations were found only during the day
 - Core area was found for only the 8 week period of the project.

Discussion

- Sources of Error:
 - Telemetry bearings
 - Compass readings
 - Interference

Scientific Significance

- Many agencies and individuals interested in deer ecology
 - ▣ how deer behavior changes during the rut
- Research on species aids in management
- Protection of critical habitat during sensitive times
- Rut phase may be determined by looking at home range size



Future Research

- Larger sample size
- More location data
- Other factors influencing the home range during the rut

- Although there has been extensive research on the whitetail deer, not a lot on been done on during the breeding season
 - Hard to find behavioral research on this period

References

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