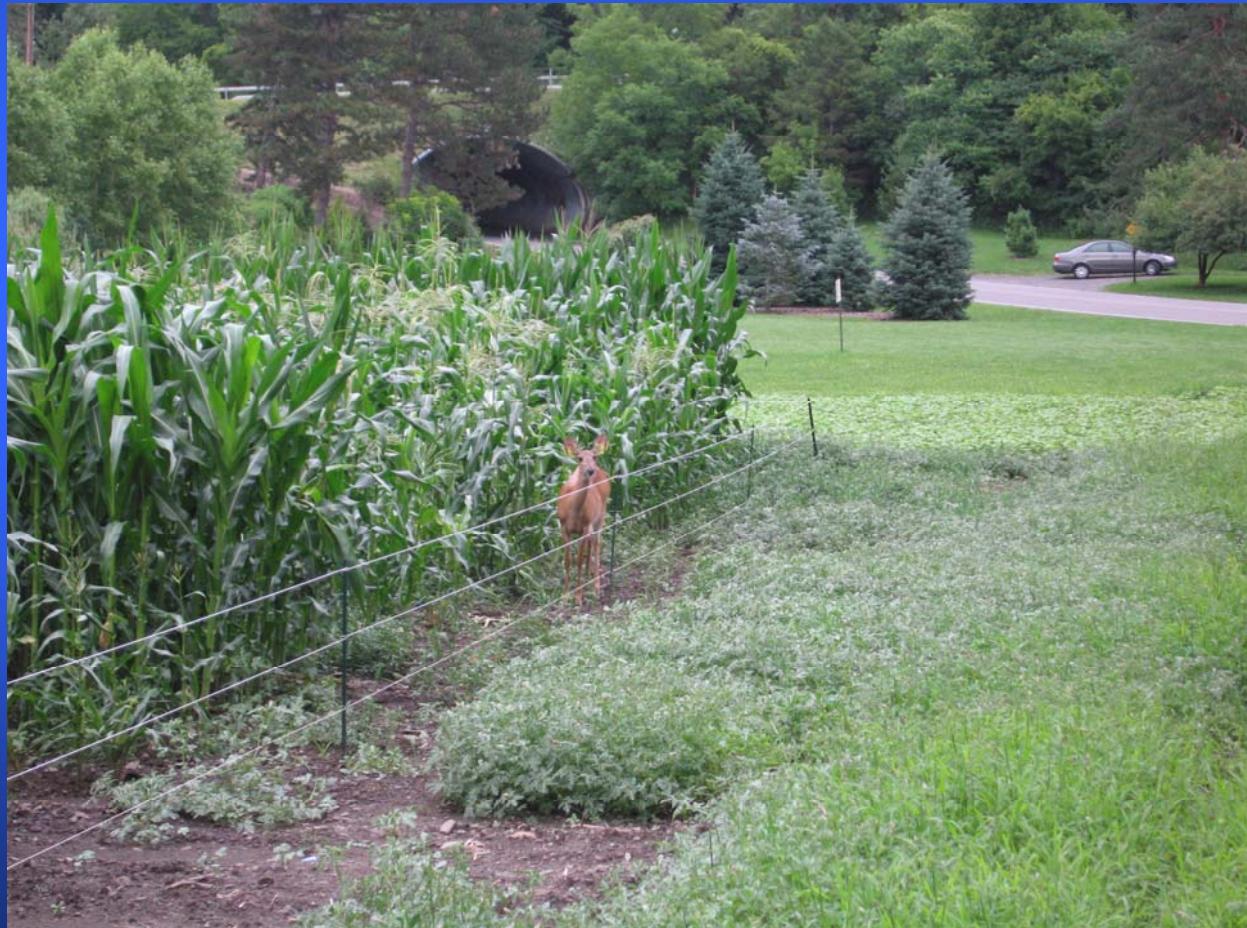


Wildlife Spatial Ecology: Deer Home Range Size and Resource Selection on the Cornell Campus

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Integrated Deer Research and Management Study

- Repellents
- Deer-resistant Plants
- Fencing
- Population Control
 - Hunting Zones
 - Sterilization Zones





Why study deer resource selection?

Objectives

- Do deer prefer one type of habitat over another?
- Does their preference vary by order of selection (Johnson 1980)?
- Does their preference vary from season to season?

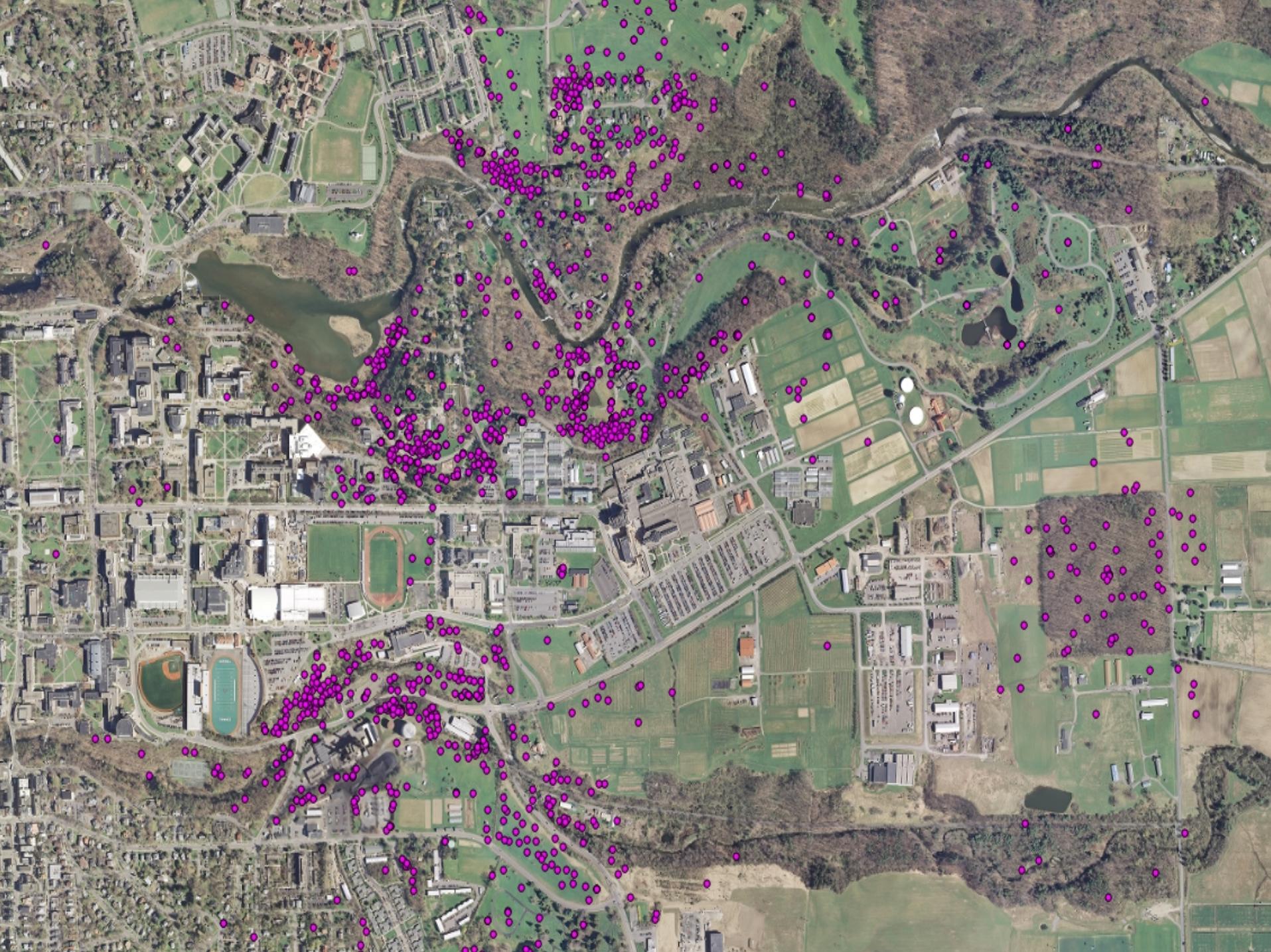
Habitat Use by Order

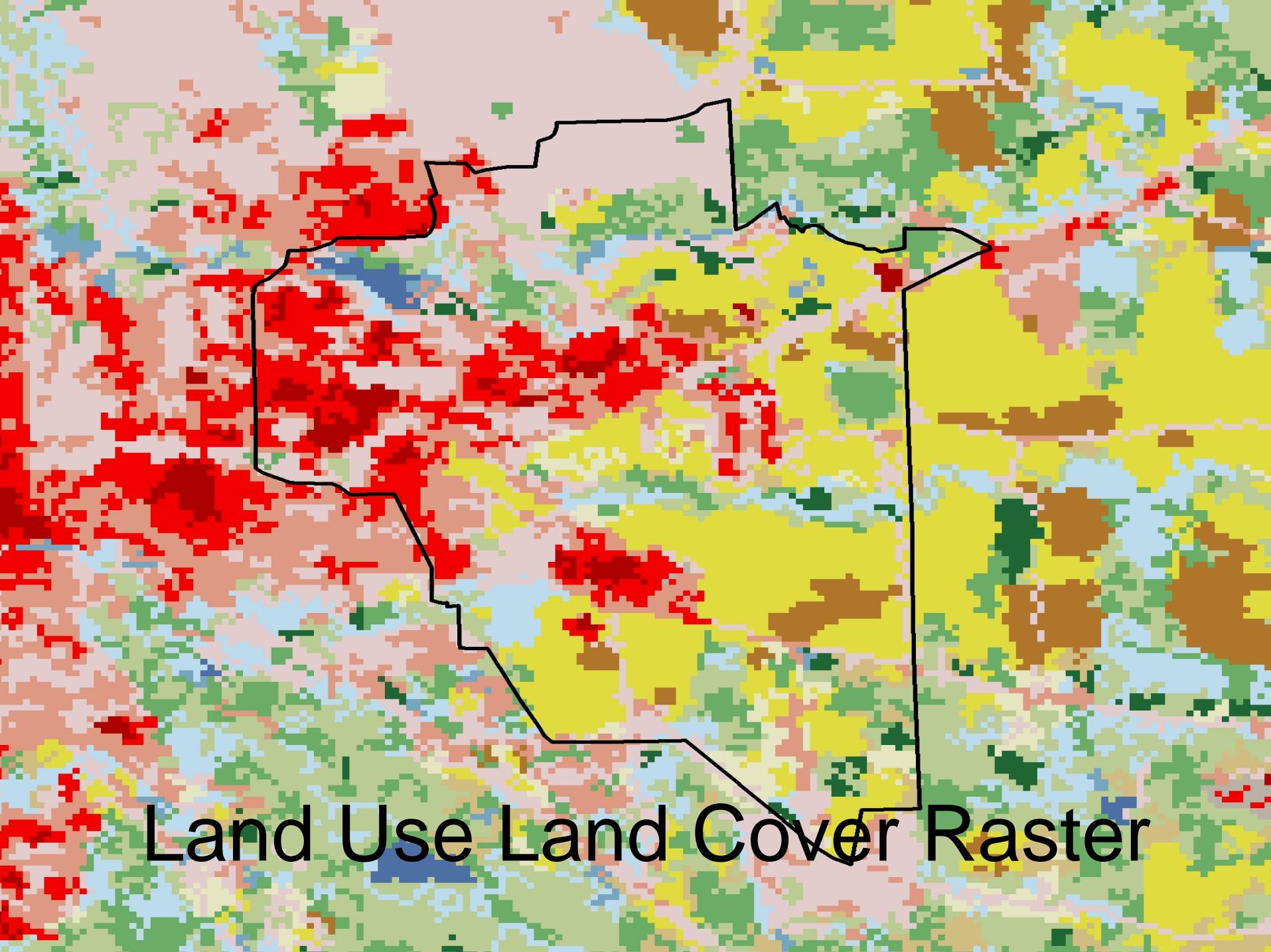
- First Order: Geographic range of the species
- Second Order: Individual's established home range
- Third Order: Specific location where an animal is found
- Fourth Order: Specific need the animal has for that location

Methods



- Capture deer with Clover traps or dart rifles
- Fit animals with ear tags and radio collars
- Conduct telemetry
- Enter telemetry fixes into geographic information system (GIS) program
- Create selection map
- Analyze selection by order and season

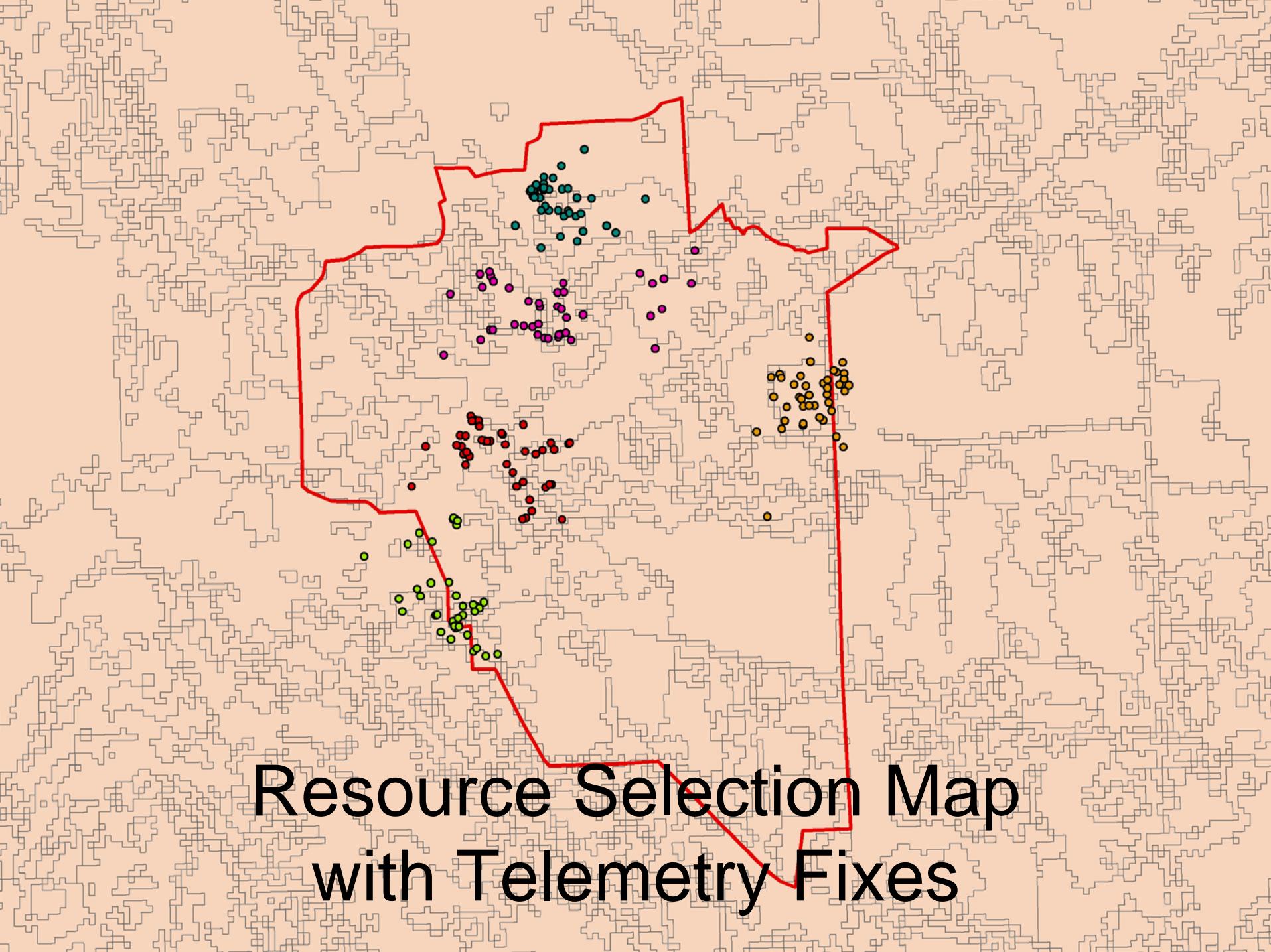




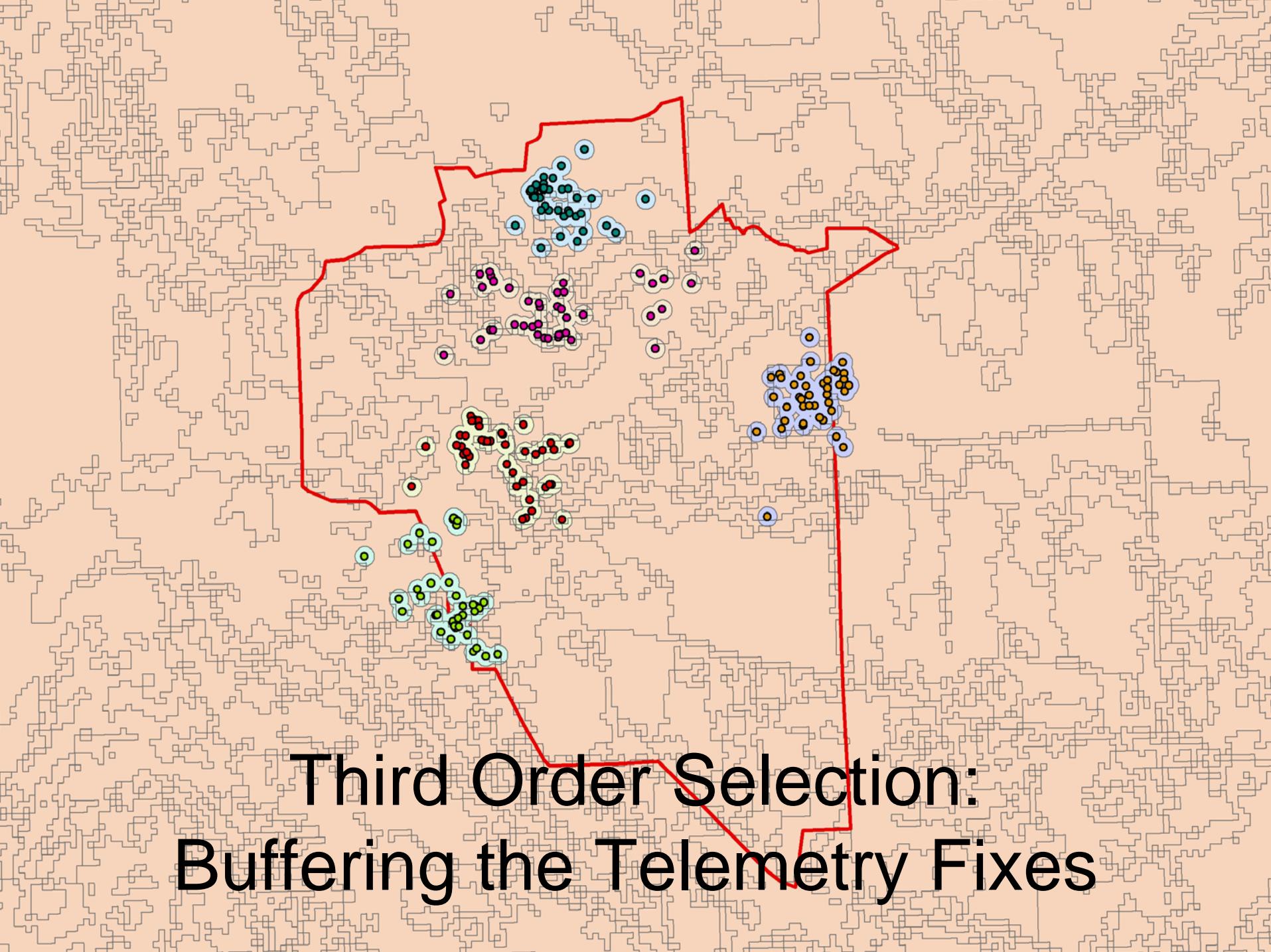
Land Use Land Cover Raster

Reclassification of Land Use

Number	Description
1	Developed, open space
2	Developed, low and medium density
3	Developed, high density
4	Mixed forest
5	Pasture, hay, and cultivated crop fields
6	Open water, wetlands
7	Other remaining land types



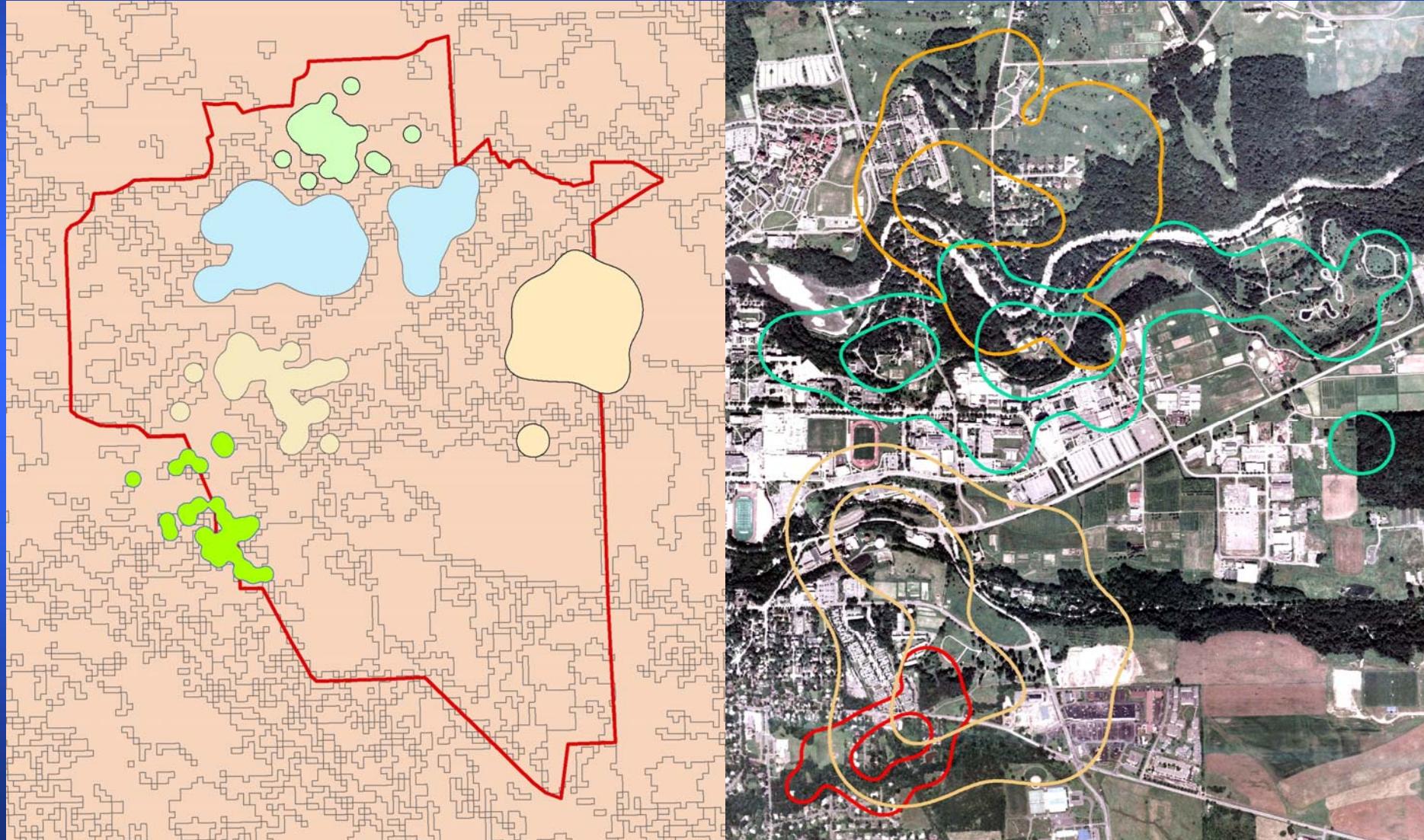
**Resource Selection Map
with Telemetry Fixes**

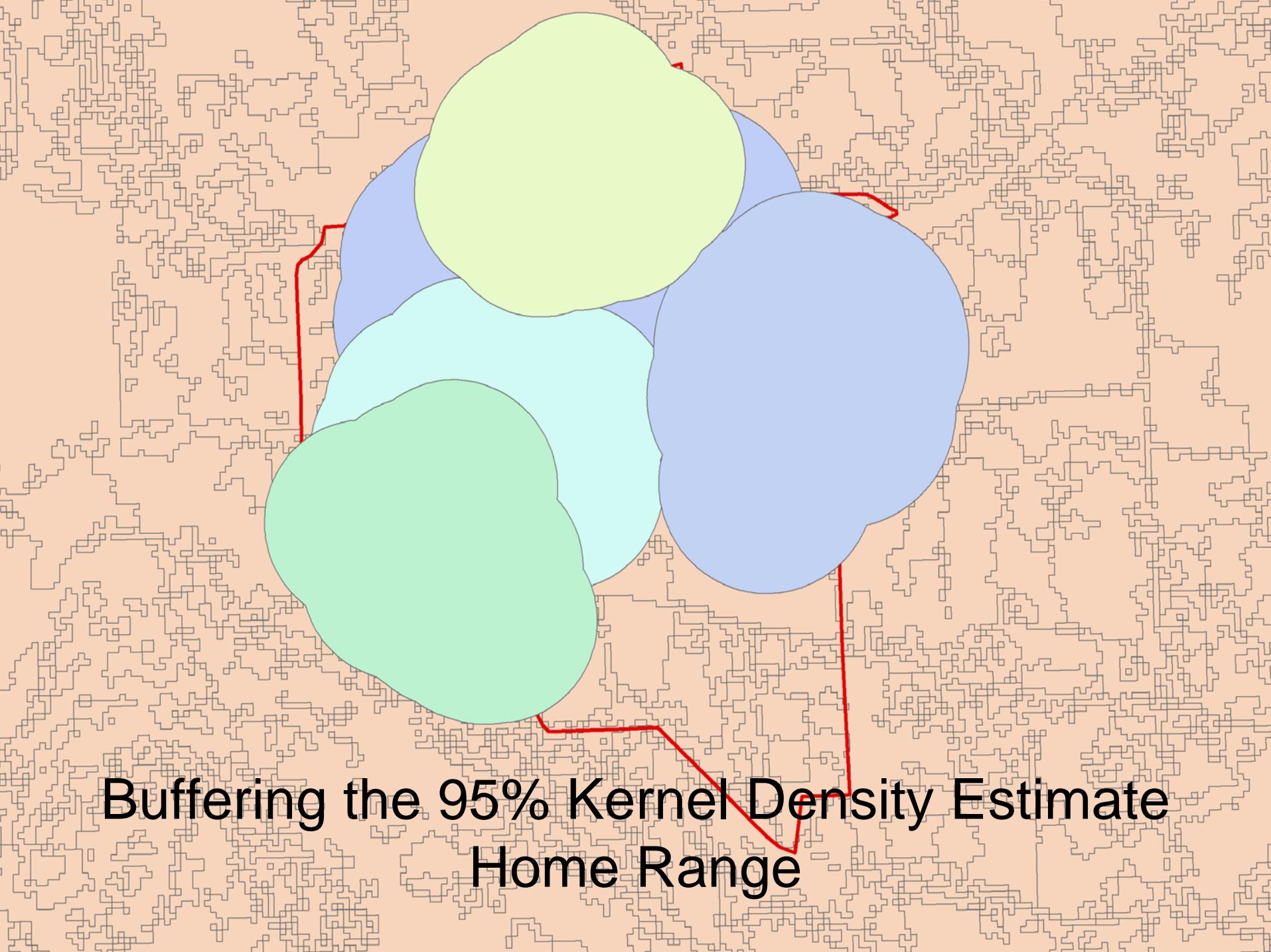


A map featuring a complex, fractal-like boundary composed of many small, light-gray rectangles. A single, irregular red polygon is overlaid on this boundary, containing several clusters of colored circular markers. These markers are colored in various shades of blue, purple, yellow, and red, representing different data points or fixes. The red polygon appears to be a buffer zone or a specific area of interest defined by the surrounding fractal boundary.

Third Order Selection: Buffering the Telemetry Fixes

Second Order Selection: 95% Kernel Density Estimate Home Range





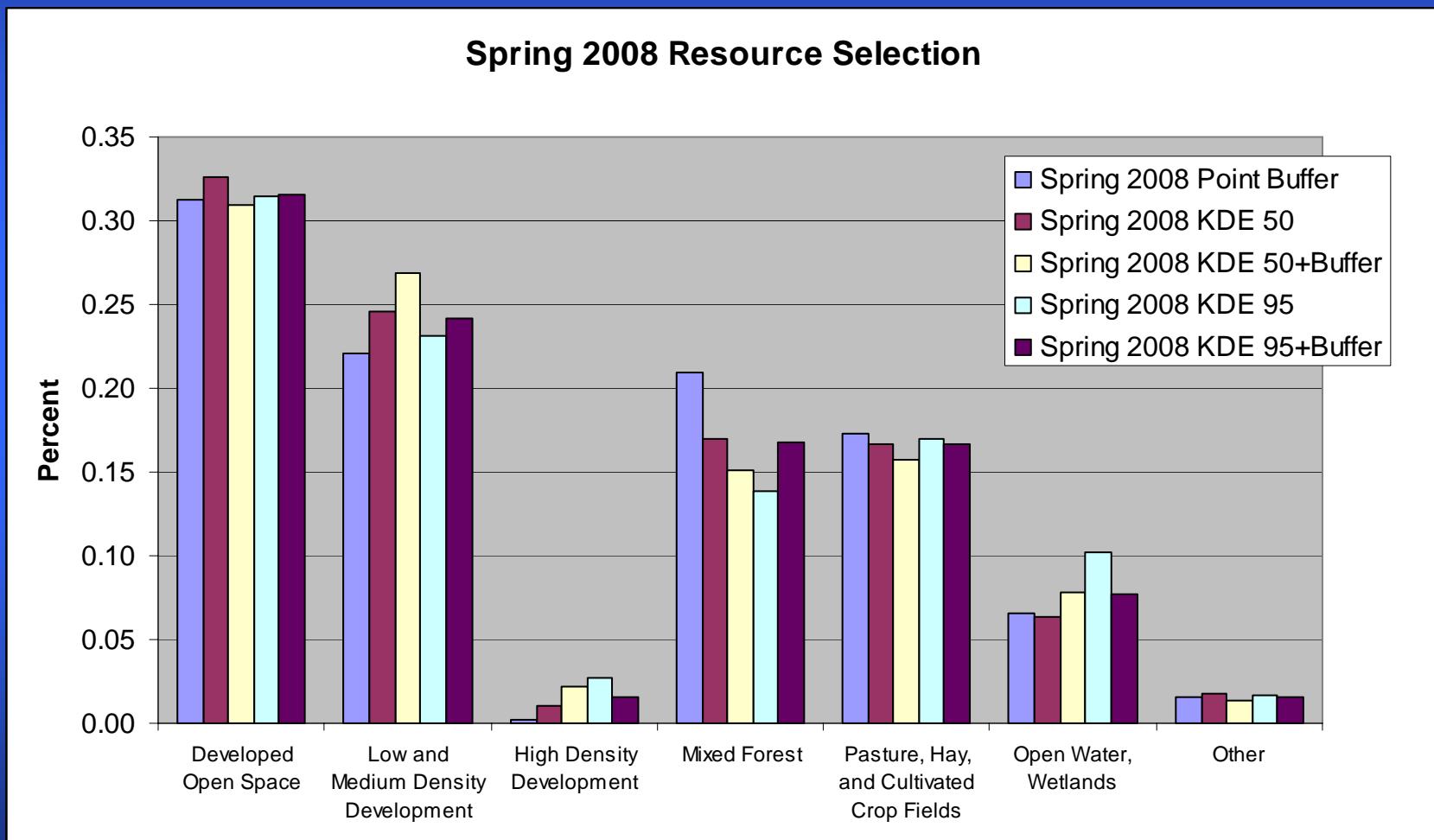
A map illustrating the buffering of a 95% Kernel Density Estimate (KDE) home range. The background consists of a grid of small, irregular polygons in light gray and tan colors. Overlaid on this grid are several large, semi-transparent colored circles representing the KDE home range. The circles are colored in a gradient: yellow-green at the top, blue on the right, cyan in the center, green on the left, and purple at the bottom. A red polygonal line outlines the 95% confidence interval of the KDE, which is a larger area than the circles. The text "Buffering the 95% Kernel Density Estimate Home Range" is overlaid at the bottom of the map.

**Buffering the 95% Kernel Density Estimate
Home Range**

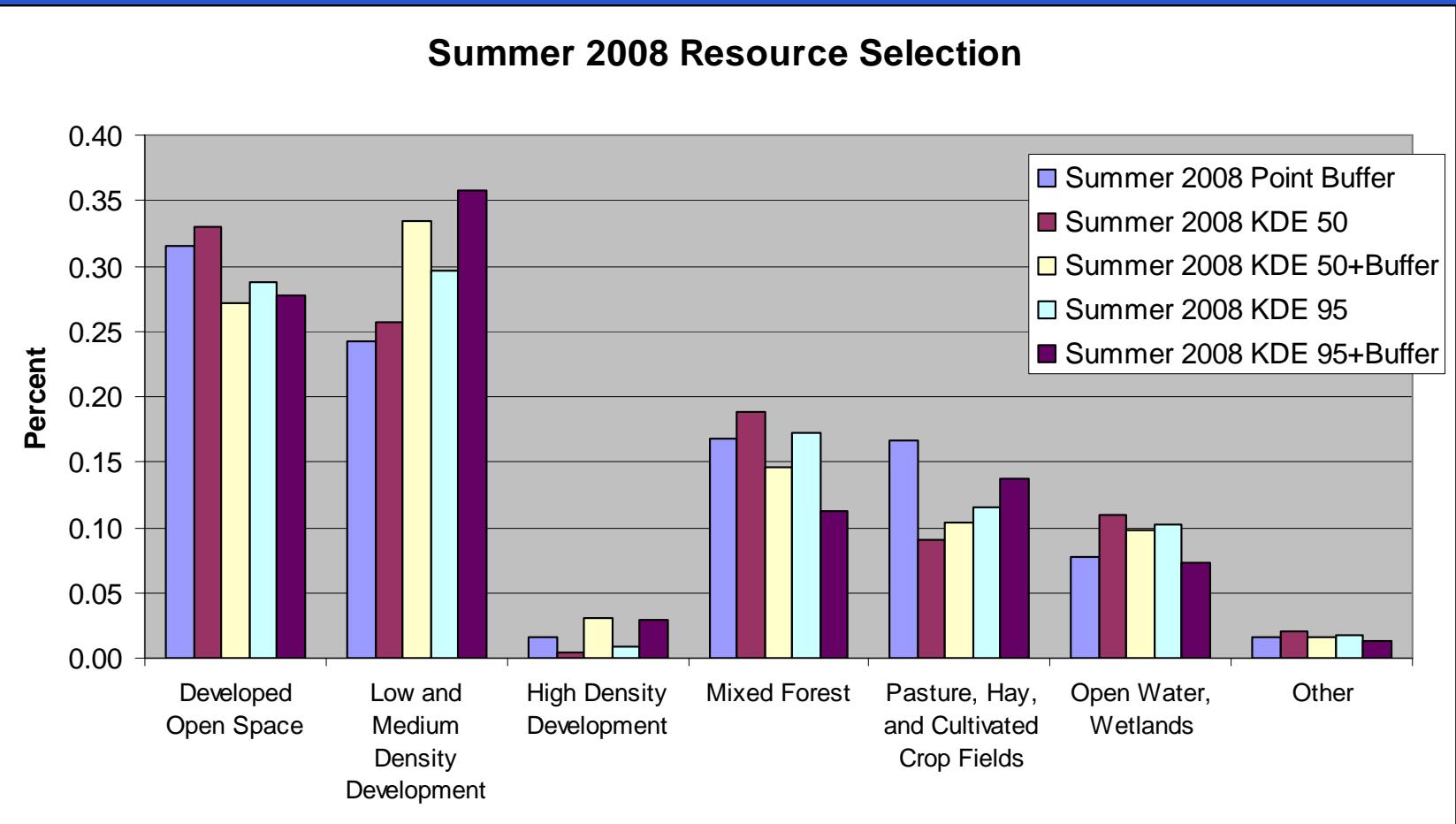
Biologically Relevant Seasons

Dates	Season	Biological Season
June 1 – August 31	Summer	Fawn-rearing
September 1 – November 30	Fall	Breeding
December 1 – February 28	Winter	Winter
March 1 – May 31	Spring	Winter-spring transition

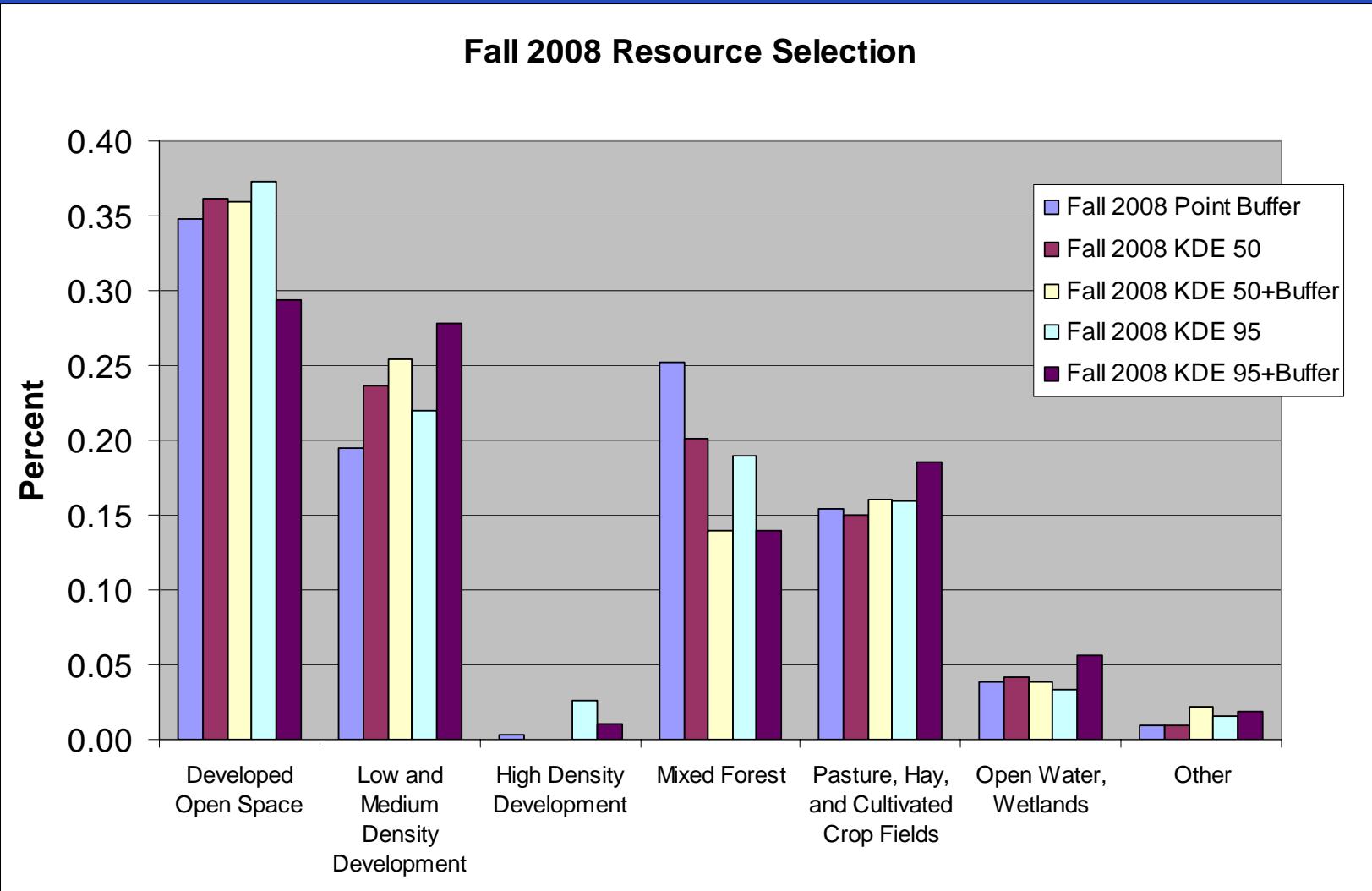
Spring 2008 Resource Selection (n=11)



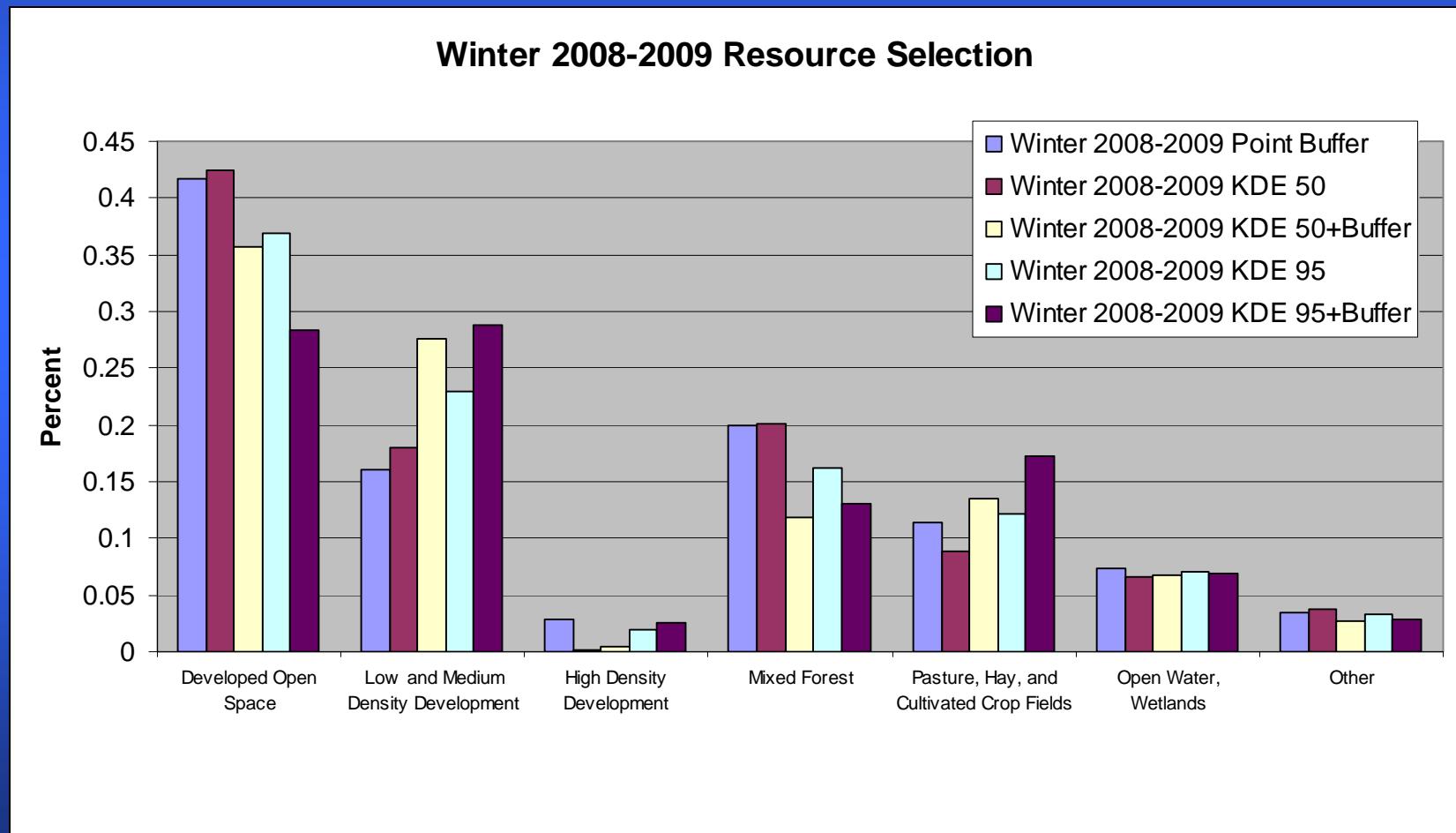
Summer 2008 Resource Selection (n=19)



Fall 2008 Resource Selection (n=10)



Winter 2008-2009 Resource Selection (n=17)



Home Range Size (ha)

Home Range	KDE 50%	KDE 95%
Spring	18.56	81.04
Summer	7.057	31.89
Fall	9.281	43.48
Winter	16.88	61.67

Management Implications

- Interrupting or removing forest travel corridors as well as increasing high density development may decrease deer capacity to inhabit an area.
- If capture and harvest regulations are seasonally dependent, managers would be best suited to look for deer in developed open spaces in winter, low or medium density development or near wetlands in the summer, and in pasture, hay, or cultivated crop fields in the spring.



Questions?