



Ranch Roads Influence Distribution of Deer

April 2009

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Sometimes research projects don't go as planned; such was the case in our study of deer use of prescribed burns in a range restoration study in Uvalde County. We put GPS collars on white-tailed deer and cattle to see whether deer moved onto the burns to feed on the succulent new vegetation, whether deer and cattle competed for this resource, and whether the animals may over use these areas. We had not counted on a severe drought beginning just after the burns were completed. Without rain there was no new flush of tender vegetation on the burns and therefore there was no response from the animals. All we learned was that in semi-arid regions range restoration by prescribed burns can be an uneconomical proposition if you are unlucky with the weather. However, we did have a lot of detailed data (about 240,000 GPS fixes) on the locations of rangeland cattle and deer throughout the year. We decided to use this information to investigate how animal distributions are influenced by ranch infrastructure such as roads, water tanks and deer feeders.

We compared the distribution of real animal locations in each season with the distribution of an equal number of random points generated by the computer. This showed us which patterns were due to decisions made by the animals and which patterns were just due to the number and placement of roads, water and feeders. Finally we tracked the locations of individual animals recorded at five minute intervals to see how individual deer and cattle interact.

Results

Everyone knows that cattle use roads as easy travel routes in brushy country but we were surprised to find that deer do the same. We had expected that deer, being a hunted species, would be more wary of roads where humans travel. Instead deer spent 53% of their time within 300 feet of ranch roads and for 5% of the time they were actually on the road. This attraction to roads was not caused by "cornering the roads" since it occurred in all seasons of the year.

We paid particular attention to animal distributions two hours after sunset and two hours before sunrise because this is when they are most likely to be feeding. At this time both deer and cattle were distributed much closer to the roads than expected from random placement. Presuming they were feeding at the time, this suggests that vegetation near roads will be more heavily used than plants in more remote areas. Hence browse surveys conducted near roads may be useful for early detection of over use of vegetation.

Deer showed very little seasonal change in their distributions, other than bucks expanding their range in the rut. Cattle stayed closer to water and spent more time close to roads as the drought progressed and natural food became less abundant.

Unlike cattle, deer did not stay close to water and feeders but just came in briefly to use these resources. Deer tended to come to water at dawn and dusk when the cattle moved away to graze after spending the day resting under shade trees near the water.

The cattle did not have access to the deer feeders. Male and female deer differed in their use of deer feeders. At dawn and dusk bucks tended to be found near feeders. Does did come in to the feeders but did not stay long, so overall their distribution relative to feeders was no different from random.

The interaction of deer and cattle at water suggests competition for resources may occur but in reality the animals separated out in time. Deer and cattle shared use of the more productive areas of the ranch but tended to separate out in time. During the project deer only came within 300 feet of cattle on 121 occasions and when they did so there was no interaction between the species until cattle were within 150 feet of the deer, at this point deer generally moved away.

What does this mean?

- Animal distributions are influenced by ranch infrastructure, particularly the ranch roads.
- Both deer and cattle use roads as paths of least resistance, which may affect the distribution of grazing and browsing.
- Over grazing by cattle around water tanks is well known. This research suggests the intensity of grazing and browsing may also radiate out from roads.
- Placement of water and feeders did not have a large effect on the distribution of deer because they tend to use these resources briefly then leave. Although previous research has shown that deer browsing increases near feeders.
- Bucks may be more affected by feeder placement than does because they spend more time near the feeders.
- Deer and cattle used the same areas but separated in time. The avoidance distance of deer for cattle was only 150 feet which is minimal on the scale of resource distribution on rangeland. Therefore the presence of cattle at moderate stocking rate should not prevent deer from accessing the better feeding areas or water.

About the Author:

Susan Cooper is an assistant professor with a joint appointment at Texas AgriLife Research and Caesar Kleberg Wildlife Research Institute. Her interests are in effects of management decisions and natural change on wildlife populations and use of habitat. This project was conducted with the help of MS student Michael Meek and colleague Humberto Perotto.