



White-tailed Deer, Cattle and Nilgai

Sharing the Landscape

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White-tailed deer share the landscape with cattle and nilgai in much of the southeastern part of South Texas. Nilgai are large (males can weigh 600 pounds) antelope from India that were introduced in 1929 and 1930 on King Ranch; the population has expanded from an original introduction of 12 animals to more than 38,000 today.

An obvious question is: “Can all of these animals share the same vegetation and survive?” Part of the answer to that

question deals with the specific types of plants that each of the three species prefer to eat.

Scientists refer to white-tailed deer as concentrate feeders, which means they eat the most nutritious parts of plants. Specifically, they move about on the landscape consuming tips of shrub twigs and broad-leaved weeds known as forbs.

Cattle are grazers rather than concentrate feeders and primarily eat grasses, which are lower in nutritional

quality than shrub twigs and forbs. Cattle have large rumens that can ferment fibrous grasses for a long time, enabling them to glean the nutrients from them.

Nilgai diets fall in between the two species, thus scientists refer to them as intermediate feeders. They eat shrub twigs and forbs, but they can switch to a diet that is mainly grasses, because they have a much larger rumen than deer do.

So these different species can share a common vegetation resource because they eat different things.

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They also tend to use different portions of the landscape. White-tailed deer spend a lot of time in dense brush, whereas cattle tend to avoid dense brush. Cattle like to use open grassland, although they may retreat to shade provided by brushy areas when it is hot. Nilgai spend some time in brush, but they also use open areas of grassland. So, the spatial separation among the three species is incomplete, but does contribute to their ability to share the same forage resource.

We have explained the theory behind

why deer, cattle and nilgai diets should not overlap much. But, the important question is: What about the real world? How much do their diets overlap in reality?

We examined this question in a research project led by Stacy Hines Adams on East Foundation lands in South Texas. The East Foundation supported Stacy's education and her research through its charitable program. The Houston Safari Club also partially supported her work.

Stacy employed a novel approach to comparing diet composition using stable

isotopes of carbon and nitrogen. Isotopes are atoms of the chemical element that differ in the number of neutrons.

Once an animal eats a plant, the atoms in the plant are absorbed and used to make animal tissue. Therefore, the stable isotope signature of animal tissue and feces reflects the composition of the atoms that comprised the plants the animal ate. Because different classes of plants have different isotope signatures, we can detect differences in animal diets for groups of plants such as shrubs and forbs versus grasses.

Stacy and a cadre of undergraduate students collected deer, cattle and nilgai feces on six different study sites on East Foundation lands, ranging from along the Laguna Madre in Kenedy County to the brushland of Jim Hogg County during 2013-2015. They found that diets of cattle and deer did not overlap in more than 94 percent of the comparisons that they examined.

Surprisingly, diets of deer and nilgai strongly overlapped during winter (90 percent) and overlapped in 57 percent of comparisons made in autumn and spring. Cattle and nilgai had separate diets in 100 percent of autumn comparisons, 86 percent of spring comparisons and 90 percent of winter comparisons.

Conventional wisdom before Stacy's study was that nilgai diets were more similar to cattle than to deer. Stacy's work showed that the reverse was true; nilgai diets overlap with deer more than they do with cattle.

Rangelands in South Texas were still in recovery from an unprecedented drought during 2011 while Stacy was doing her study, and this may have had some influence on her results. Regardless of the effects of drought, an important take-home message for wildlife managers in South Texas is that having too many nilgai is potentially detrimental to white-tailed deer.

We recommend, based on Stacy's research, that wildlife managers interested in maintaining productive deer populations should keep nilgai populations at levels that minimize potential for competition between the two species. 🌟

