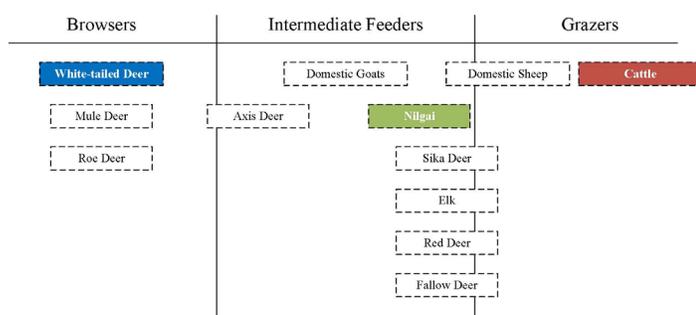


CATTLE, NILGAI, AND WHITE-TAILED DEER INTERACTIONS

Non-native animals, such as nilgai antelope, threaten the productivity of native rangelands. Specifically, competition for forage resources is a major concern for land managers, particularly during periods of drought when grass availability becomes increasingly important to livestock performance. Using traditional methods, it was believed that cattle are grazers, nilgai are intermediate feeders (though favoring grass), and white-tailed deer are browsers. Thus, nilgai should be more likely to compete with cattle for grass than deer for browse.



New techniques that include stable isotope signatures deposited in animal tissues (blood, hair, and feces) allow for the reconstruction of animal diets to determine dietary overlap and assess competition during different times of the year and under varying environmental conditions. Stable isotope analyses are more robust than traditional methods and are not prone to biases.

The East Foundation is committed to using state-of-the-art techniques to provide solutions to problems threatening native rangelands. We are determining seasonal dietary overlap among cattle, nilgai, and deer on four of the Foundation's lands using such a technique. Animal tissues and representative plant samples are collected seasonally and analyzed at the Stable Isotopes for Biosphere Science Laboratory at Texas A&M University.

Big-picture outcomes. During periods of drought: 1) cattle and nilgai diets did not overlap at any of the study sites, 2) cattle and deer diets overlapped at 17% of the study sites, and 3) nilgai and white-tailed deer diets overlapped at 100% of the study sites. These outcomes were counter to previous findings that used traditional methods and indicate that nilgai foraging behavior during periods of drought is that of a browser (similar to deer). No competition occurred between cattle and nilgai, but competition occurred between deer and nilgai.

Secondary outcomes related to refining the stable isotope technique have also been produced from captive trials.

- 5–6 days are needed for the carbon isotope signature of cattle fecal samples to reflect diet composition
- 10 days are needed for the nitrogen isotope signature of cattle fecal samples to reflect diet composition
- 5–6 days are needed for the carbon and nitrogen isotope signature of deer feces to reflect diet composition



Information generated from this project will enable ranch managers to make informed decisions on appropriate cattle stocking rates and wildlife densities on their rangelands, thereby ensuring rangeland productivity.

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