The Poop on Desert Bighorn Sheep Restoration

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The story of desert bighorn sheep in Texas will certainly go down in history as one of the most successful wildlife restoration stories of our time. The first step in restoring wildlife to their historic range is a thorough understanding of their life history. When do they breed and lamb? What sex and age ratios are optimum? How much predation can they sustain? How far do they move or range? The list goes on. The more we know about a species, the more likely we will be successful in restoring or managing them.

One of the first pieces of the puzzle a biologist must place is: "What are the habitat requirements of the species of concern?" Regardless of the situation, if you don't have the essential habitat components (food, cover and water), your efforts will be wasted. All life history traits are affected by habitat: survival, mortality, density, movements and reproductive success.

Using binoculars and spotting scopes, SRSU researchers observe a group of rams in their habitat.

Understanding the habitat requirements of desert bighorn sheep in Texas is paramount to the continued success of the Texas bighorn sheep restoration program. Accordingly, we initiated a study to evaluate the seasonal diets of desert bighorn sheep at Elephant Wildlife Management Area south of Alpine, one of the most successful restoration sites in West Texas. Understanding the foraging habits of desert bighorn sheep will be critical for evaluating future release sites in Texas and northern Mexico.

To identify which plants bighorn sheep consumed, we collected freshly deposited fecal samples during a two-year period. To ensure that gender could be properly determined and freshness was assured, we observed bighorn sheep using binoculars and spotting scopes until they defecated and then obtained the samples within four hours. Fecal samples were obtained for fall, winter, spring and summer and for rams, ewes and lambs. Fecal samples were frozen and shipped to a lab for analysis. Fecal samples were then analyzed with a microscope to identify plant content based on characteristics of their cells and cell walls.

We collected 432 fecal samples, including 209 ram, 209 ewe and 14 lamb samples. Ninety-four plants were identified from the fecal pellets including 37 browse species, 34 forb species, 20 grasses and three succulents. The diets of rams and ewes were nearly identical for all seasons. On average, (rams and ewes combined) their annual diet included 50 percent browse, 35 percent forbs, 11 percent grasses and four percent succulents. Lamb diets were only obtained for spring and summer and consisted of a higher amount of forbs than adults – 43 percent forbs, 42 percent browse, 10 percent grasses and five percent succulents.

Wild buckwheat, four-winged salt bush, ratany and trumpetflower were the dominant browse used by all bighorns. Prickly pear and cholla cacti were the dominant succulents and muhly grasses were dominant grasses. Bighorns ate a variety of forbs, but globemallow was the dominant species.

We also compared our results from similar diet data collected from the northern Trans-Pecos region. Bighorn rams from the Sierra Diablo, Beach and Baylor mountains relied more heavily on browse and grasses than rams from Elephant Mountain, which consumed more forbs. In general, forbs are less available in the northern mountains of the Trans-Pecos than at Elephant Mountain.

Throughout the west, desert bighorn sheep rely heavily on browse to meet their nutritional needs. Forbs are generally thought of as having higher concentration of nutrients than browse, but since forbs are less available throughout their rugged, dry habitat, bighorns rely less on forbs. In contrast, pronghorn, mule deer and white-tailed deer are considered "concentrate selectors." That is, they generally select foods with high concentration of nutrients (forbs) and resort to browse in the absence of forbs (fall and winter or in drier environments).

Desert bighorn sheep habitat can include other ungulates, such as desert mule deer, elk, javelina, and even pronghorn and Carmen white-tailed deer, in some rare situations. Resource managers and landowners should be mindful of the potential for competition of forage resources that may exist between each of these species. This is especially true in ranges that artificially raise carrying capacity or concentrate animals using supplemental feeding.

Our understanding of the foraging habitat of desert bighorn sheep is just one piece of the puzzle in restoring and maintaining desert bighorn sheep throughout out their historic range of West Texas.

After the sheep defecate, graduate students scour the vegetation in search of the ever-elusive poop.