



KONZA PRAIRIE BIOLOGICAL STATION FACT SHEET

BISON & CATTLE GRAZING PROGRAMS

Historically, grazing was an important ecological process in tallgrass prairie and bison were the dominant large mammalian herbivore. In the Flint Hills, bison disappeared in the last century as European settlers arrived and established cattle grazing as the primary land use by the late 1850s.

Bison and cattle herds are maintained on Konza Prairie primarily for research on the role of grazing in the ecology of tallgrass prairie.

Bison were reintroduced onto Konza in October, 1987. The original bison area (Phase I) was 1,160 acres (469 hectares). An additional 1,186 acres (480 hectares) were added in May, 1992 (Phase II). **The current bison area is 2,345 acres (949 hectares).**

The herd originated with 30 animals donated by Fort Riley. The herd size has increased through an additional donation from Fort Riley, purchase and trade of animals, and reproduction within the herd. More than 100 calves are born on Konza each spring.

The standing herd is maintained at 300-320 animals. Currently, the sex ratio is about 70% mature females and 30% mature males. The weights of bison on Konza range from <100 lbs. (new male calves) up to 2000 lbs. (largest bull). The average mature female weighs about 1000 lbs.

The bison stocking rate on Konza Prairie is approximately 12 acres per bison unit. A mature cow is one bison unit.

Data on plant productivity and bison weights and forage intake rates are used to calculate stocking rates. The bison stocking rate is set such that 25% of the annual aboveground plant growth is consumed during a 12-month period. This is considered moderate grazing intensity when compared to seasonal (May to October) cattle grazing in the Flint Hills.

Average plant (forage) production on Konza is 3,500 lbs. per acre. Bison forage intake varies throughout the year—probably peaking around 2.5% of body wt in May and June, declining throughout the summer, and dropping to less than 1% from November to March. Intake at 1% body wt would be about 100 lbs of dry matter per month per animal unit.

Bison remain on the prairie year-round. They receive no supplemental food unless the weather is severe (especially hot, extremely dry summers or ice-covered forage in winter). They do receive supplemental salt and other minerals in the corral to accustom them to the roundup area.

Culling of the herd began in November, 1994, when 51 animals were sold. Currently the herd is rounded up each November. To maintain a constant herd size and age structure, animals within the youngest and oldest age classes are culled and sold each year. This simulates the removal of young animals and low-

vigor older animals that likely occurred with natural predation. Animals culled for sale are tested for brucellosis and tuberculosis.

Ear-tag numbers of Konza bison follow a standard numbering system used for The Nature Conservancy herds. All KPBS bison calves receive ear tags at the Fall Roundup when they are about six months old. With time some of the tags are replaced because of loss or damage. The tags are numbered and color-coded to keep track of the age of the animal, its origin and affiliation to other members of the herd. The first number on the tag is the year of birth. The following 2 numbers are the individual's id.

Blue tags represent the 1980's;

White tags represent the 1990's;

Yellow tags represent 2000's;

Green tags are on the bison donated by Mrs. Green. Their ages are known.

Green tags with a "B" are of unknown age. In the other ear the green-tag animals have either a white or yellow tag for the decade of their birth.

An "A" before a number are animals that lost their tags and could not be identified by age.

Grazing research on Konza Prairie includes: 1) LTER studies on the effects of grazing and fire interactions on the tallgrass prairie ecosystem, 2) studies on bison foraging selectivity and plant responses to grazing, 3) a patch-burn study started in 2009 includes research on cattle foraging in different burn treatments, 4) herd distribution and grazing movements are tracked with global positioning system (gps) collars on dominant females, 5) a study of comparison of bison and cattle was completed after 13 years.

The current cattle are a steer herd owned by the KSU Department of Animal Sciences and Industry. The patch-burn study area (Shane Creek watersheds and Texas Hog Pasture) is grazed from mid-May through mid-October. The cattle stocking rate is set such that the grazing intensity is equivalent to that of the bison (removal of 25% of annual aboveground plant production).

Results of the previous bison-cattle comparison studies: Bison and cattle grazing effects were compared in a series of small (12 acre) pastures in which young bison and cattle of the same weight were grazed from May 1 through October 1. The differences between bison and cattle grazing are minimal when management practices and stocking rates are the same. Because cattle graze only 5 months of the year and bison graze year-round, it is impossible to determine whether tallgrass prairie responses to bison vs. cattle reflect differences in the animals *per se* or differences in their management. Species richness was higher and end-of-season grass lower in bison pastures than in cattle pastures. Comparative studies of bison and cattle effects on tallgrass prairie were supported by grants from the USDA and NSF.

Over 50 small fenced "exclosures" (16' x 16') are located throughout the bison area. Vegetation data collected inside and outside the exclosures as well as in grazed and ungrazed watersheds are used to assess effects of bison on the plant communities. Biomass clippings are collected throughout the growing season.