



Konza Bison Fact Sheet



Herd Statistics

Area: 2433 acres (984 ha). 10 experimental watersheds (2 burned annually, 2 biennially, 4 quadrennially, and 2 every 20-years).

Initiation: 30 bison introduced to 450 ha unit in October 1987, remaining area opened in 1992.

Average herd size: 286 adults, yearlings and calves (210 Animals Units; one Animal Unit = 1,000lbs) (2000-2017).

Herd size over time: Herd has grown mostly through natural reproduction, but with some introductions from other herds.

Stocking rate: Population size is based on ~11.5 acres per Animal Unit with an annual removal of 25% of aboveground plant productivity.

Birth rates: Average calving rate (2000-2017) is 62 calves per 100 mature females

Field death rates: On average 4.1% of the herd dies each year in the field. These are generally the young or very old.

Sex ratio: Approximately 5.3:1 mature females to mature males (2000-2017).

Supplements: Bison receive supplemental salt and minerals and only rarely supplemental feed.

Round-ups: Animals have been collected and weighed each year since 1994. This work represents the *longest continuous record of weight gain for native ungulates in the world*.

Culling practice: Culling began in 1994. Generally, most individuals are sold as yearlings or 2-year-olds, the heaviest 5-6 males and 15-18 females per cohort being retained for breeding. Mature males are culled at 7 years old, and mature females are culled if they have not calved in the previous 2 years.

Age distribution: Females can be as old as 20 years and there are no males older than 8 years.

Heaviest animal ever: 2050 lbs (931 kg); 2006 7-year old male.

Genetics: The Konza bison have no animals with mitochondrial cattle genes.

Performance

Forage quality: In tallgrass prairie, bison growth is limited more by protein than by total calories. Seasonally, crude protein peaks in early May and declines quickly thereafter. By early to mid-July, forage quality is likely at maintenance levels.

Weight loss over winter: In these grasslands, bison lose approximately 10% of their body mass over the winter, except for calves which gain ~3%.

Weight gain over time: Males steadily gain weight over the first 10 years, while females level off once they are reproductive. In a given year, females that have a calf only gain 1.5 kg, while those that do not calve gain 31 kg.

Climate controls on weight gain: Bison gain more weight in years with greater late-August precipitation (~15kg/100mm during this period), but less weight with greater late-June, early-July precipitation (~-15kg/100mm during this period).

Climate controls on calving rate: In years with high August precipitation (Aug 10-22) calving rate is higher the next year (+18 calves/100 females/100 mm precipitation during this period).

Calving rate by age: Most females do not calve until their third year. Peak calving rate is at 9 years old. Approximately 60% of 3-year old females calve, while 75% of the 9-year olds calve. Calving rate declines linearly 3 calves/100 females/year after bison are 9 years old.

Ecosystem consequences

Over 50 small fenced exclosures (16' x 16' or 5m x 5m) 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 plant communities and ecosystem properties.

Vegetation: Bison preferentially eat grasses. Their grazing increases the proportion of forbs in the grassland and increases the local plant diversity. Often, bison repeatedly graze areas with shallow soil, which creates grazing lawns of short grasses. Bison preferentially graze in recently-burned areas during the growing season, but preferentially graze in unburned areas during the winter.

Photosynthesis and growth: Grazed tillers have higher rates of photosynthesis (up to 150% higher) than ungrazed tillers, but less total leaf area. Grazing can reduce belowground plant productivity by 30%.

Nutrient cycling: Nitrogen mineralization and nitrification is enhanced up to 6x by grazing.

Fauna: Grazing by bison increases the abundance of forb-feeding grasshoppers. Bison grazing increases the abundance of Upland Sandpiper and Grasshopper Sparrow, while lowering the abundance of Henslow's Sparrow and Dickcissel.

Fire: Bison grazing reduces the amount of grass that is left standing at the end of the year. As such, fires are less intense and/or continuous in grazed areas.



Wallows: Bison create wallows up to 5m in diameter and 30 cm deep. Some bison wallows hold water and serve as both sources of drinking water and habitat for wetland plants and animals.

Carcasses: When bison die, the nutrients they contain are returned to the soil in a small patch. These patches support a short burst of high productivity with unique plant species present.