

Bison Ranching

The challenge and reward of raising this hardy and majestic animal is second to none.

We learn from them and their survival instincts and ensure their continued presence in North America's future.

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Summary

North American bison (*Bison bison*) are an attractive, high-value livestock species that is growing in number and popularity across the United States. While bison ranching has some similarities with cattle ranching, there are significant differences that must be accounted for to ensure long-term sustainability and profitability. Bison are a hardy species that tolerate hot climates of southern Texas and cold climates of northern Canada, utilize a wide variety of native forages and forbs that may not be as palatable to cattle and require less handling than cattle. Furthermore, bison are not domesticated, and therefore they are more wild, larger and stronger than cattle, and they should be managed as such.

A few things to consider when starting with or converting to bison ranching: 1) bison largely remain a wild and undomesticated species — treat them as dangerous wildlife, 2) precipitation and drought will affect summer growth and gains — more drought will reduce growth rates and 3) mind your genetics, avoid inbreeding.

Introduction

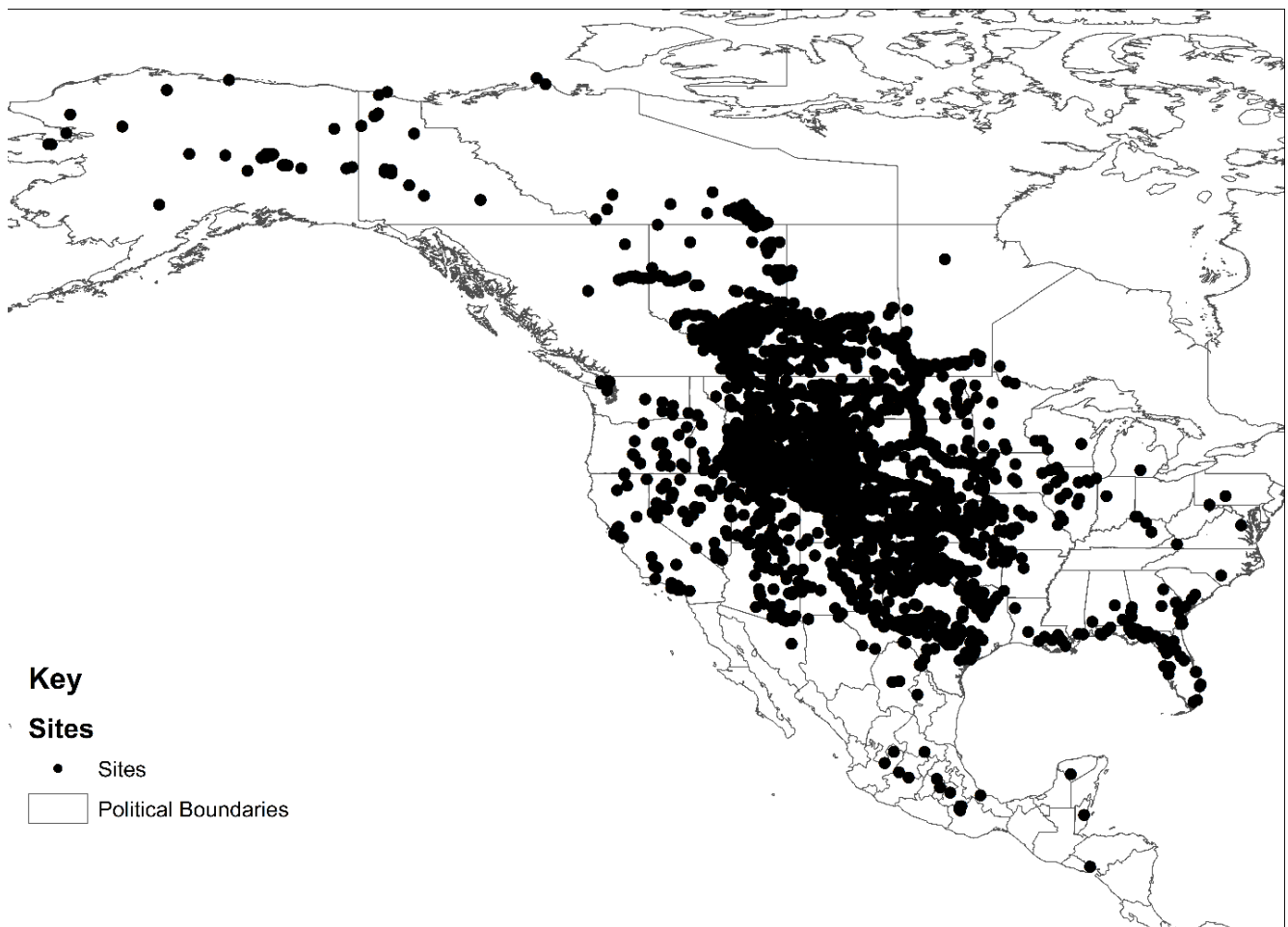


Figure 1. Historic and prehistoric distribution range of North American bison (*Bison bison*) across Canada, United States, Mexico, Belize and El Salvador over the last ~40,000 years (n = 4,713 observations; Martin et al., in prep).

Bison are a pillar of North American natural history — appearing on flags, official governmental seals and history books across North America, particularly in the United States. While bison are not domesticated like cattle, they make for an attractive alternative species for landowners across the Great Plains and surrounding regions. They are hardy and integrate well into native rangeland restoration and tolerate Texas summers and Canadian winters alike (Figure 1). Accordingly, private herd sizes have continued to increase over the years as markets and consumer demand grow, making bison ranching financially attractive ([Bison Economics Tool](#)).

Getting started in raising a bison herd requires adequate preparation along with the right management approach. A landowner should not expect bison to handle like cattle, and bison require a robustness of fencing, equipment and facilities that exceed typical cattle requirements. Once these topics are accounted for, bison can be readily reintroduced to the Great Plains and prairie landscapes they once ranged freely. Prior to 1868, between 30–60 million bison ranged across North America (Figure 1). Their populations were rapidly reduced to less than 1,000 remaining animals 20 years later. Recent reintroduction of bison for meat production has brought back herd numbers and has helped diversify livestock operations across the Great Plains.

Bison Biology and Behavior

INDIVIDUAL BEHAVIOR

In general, the internal workings of bison are similar to cattle, insofar as they are both ruminants with a four-chambered stomach. Bison retain many wild traits lost in cattle that include large flight-zone distances, short tempers and overall minimal domestication traits. As a general rule, expect bison to behave more like wildlife than domesticated livestock. As such, low-stress, low-pressure stockmanship and ensuring that handling facilities are built to reduce animal stress will reduce the chance of injury to the animal and the handler. Bison are extremely sensitive to stress, which can lead to reduced animal performance at best and animal death at worst. In the field recognizing these elevated stress and defensiveness levels is critical and may be identified by the following: panting, raising of tail, or in extreme circumstances laying down, passing out and cessation of breathing (ultimately dying). Defensiveness (also stress-related) is exhibited by snorting, bellowing, tails straight up, pawing the ground, bluff charges, attack charges and trampling. However, bison are more resistant than cattle to extreme weather events, such as blizzards and heat waves.

Given adequate nutrition, bison cows will produce calves annually after two years-of-age and live to be 20–30 years-of-age. This longevity comes with a tradeoff in that bison grow more slowly than typical beef cattle due to a lower and more variable metabolic rate. This slower growth results in a prolonged market turn around (20–30 months) compared to beef cattle (~18 months).

HERD BEHAVIOR

Bison herd behavior is dictated by both size of herd and seasonal cycles. Small herds (fewer than 30 individuals) behave as a cohesive nuclear unit, led by the dominant hierarchy of elder matriarchal cows. The other members of the herd maintain a hierarchy of less-dominant females, such as betas who operate as herd sentries that monitor nearby threats and safety, as well as rank-and-file, sub-adult individuals, twolings, yearlings and calves. Satellite bachelor groups of young males (two-to-five years old) will form and the older males (greater than six years old) will often be solitary for most of

the year. During rut (July–September), the males will regroup with the main herd for competition and breeding. Heightened herd aggressiveness is also exhibited during calving season, when cows are particularly defensive for their newborns. Anecdotally, total herd sizes greater than 30 individuals remain more calm than smaller herds.

GRAZING BEHAVIOR

Bison prefer to consume grasses, sedges, some seasonal forbs and may browse woody plants and other plants when preferred forage is unavailable. Like cattle and other bovines, bison only have lower incisor teeth and a hard-upper palette. However, unlike cattle, bison have different grazing habits. Whereas cattle will favor an area and heavily utilize it before moving on, bison will instead graze lightly while ranging over a larger area — thereby reducing grazing pressure at individual points relative to the whole pasture, but may also have favorite areas that are revisited more consistently. Additionally, due to their larger body size, bison have increased forage digestion retention time compared to cattle, which allows them to digest poorer forages more efficiently. However, basic stocking rate-based management is still critical—overstocked bison will still overgraze a pasture, just as cattle will.

WALLOWING

Another distinctive characteristic of bison is their wallowing behavior. By wallowing, bison expedite the shedding of fur while the dust helps protect their skin from irritation and pests. The shedding, or molting, of winter fur also helps to disperse seeds of both grasses and desirable forbs. These wallows are often found in the middle of a pasture and should be left on the landscape and not be filled in, as they often serve to add plant and animal diversity to rangelands. Should these bison wallows get filled, the bison will simply open a new wallow elsewhere. Thus, these wallows should be considered temporary sacrificial areas when determining stocking rates.

Bison Herd Health Management

According to the U.S. Department of Agriculture (USDA), 41% of existing bison operations experience bison death loss or euthanasia due to disease, injury, mishandling or austere weather — these deaths, however, only account for approximately 2% of the bison population. Bison death loss is largely explained by four top factors: 1) 61% are disease and health-related problems, 2) 23% are non-predatory injury and trauma, 3) 13% are handling-related problems and 4) less than 11% are weather-related. It is interesting to note that calving-related deaths are negligible in bison mortality reports, compared to 17% of beef cattle death losses are calving-related. As such, managing herd health is critical for reducing potential death in the herd.

Bison, like all animals, are susceptible to various pathogens, gastro-intestinal parasites and nutritional deficiencies and toxicities. Common diseases in bison include calf scours, Johne's disease (*Mycobacterium avium paratuberculosis*), bovine respiratory disease complex (BRD; a.k.a. shipping fever), infectious bovine rhinotracheitis (IBR), parainfluenza-3 (PI-3), bovine respiratory syncytial virus (BRSV), *Mannheimia pneumonia*, *Mycoplasma bovis*, bovine tuberculosis (bTB), listeriosis, brucellosis, bovine virus diarrhea (BVD), internal parasitism (*Cooperia*, *Haemonchus*, *Monezia*, *Nematodirus*, *Oesophagostomum*, *Setaria*, *Trichostrongylus*, *Trichuris*), ostertagiosis, anaplasmosis, coccidiosis, liver flukes, lungworm, *Toxocara vitulorum*, copper and selenium

deficiencies, clostridial diseases, blackleg, anthrax, histophilus, malignant catarrhal fever (MCF), pinkeye, bluetongue virus (BTV) and epidemic hemorrhagic disease (EHD). The National Bison Association has an [in-depth guide on bison disease](#) that may be purchased through their online resources.

Common, tell-tale signs of unhealthy bison include emaciation, lethargy, coughing and voluntary seclusion from the herd. One of the field monitoring tools to compare herd and individual health is by using Body Condition Scores (BCS). On a five-point scale with “5” being obese and “1” being emaciated, conservation-oriented herds should strive for an average BCS of 3.1 for the herd, while production-oriented bison herds should strive for an average BCS of 3.8 for the herd. It is important to monitor these behavioral and body condition scores for changes out of normal. As an example, emaciated animals may be indicative of poor nutrition, gastro-intestinal parasite infestation or disease infection and should be used to make management decisions regarding health interventions for those individuals or the herd. Establishing a frequent and regular parasite monitoring program for your herd is important to become proactive, instead of reactive to health problems. Contact your veterinarian or local extension office for labs that can conduct this testing.

As with any animal operation, dealing with animal carcasses is an important consideration. While this is an unfortunate part of operating animal herds, these carcasses are still a wealth of information for your operation. It is often worth conducting a necropsy to learn the cause of death for the animal, because it may provide a deep look into what else might be ailing the rest of your herd. Working with your herd veterinarian is essential to correctly and safely conduct a necropsy. The Center of Excellence for Bison Studies has [resources](#) available to assist you in obtaining pre-assembled necropsy kits that you can purchase as a contingency, and it has a long shelf-life.

Managing Rangelands and Pasture for Bison

Historically, bison ranged across almost all of North America and can acclimate to a variety of climates and ecosystems. As with any livestock, maintaining a healthy stocking rate compatible with your local carrying capacity is key for the long-term sustainability of the rangeland or pasture, as well as the herd itself. Overstocking a pasture can lead to degradation in forage quality, increased parasite and health issues and reduced soil productivity.

Determining stocking rate for bison is similar to other livestock species, as it is a function of the total number of animal units (AU) per acre of productive range or pasture. Bison are generally equivalent to cattle in terms of animal unit equivalents (AUE), with a bison cow and calf generally equating to one AUE. Appropriate stocking rates vary depending on forage type, precipitation and a number of other factors (collectively referred to as carrying capacity). For more information on appropriate stocking rates in your region, contact your local extension office. Also use this [grazing calculator webtool](#).

Integrating bison into existing pasture and range management systems may be straightforward. Particularly, bison and prescribed fire are a traditional combination, which integrate well. Both history and research note that bison congregate and graze in recently burned areas, selecting newly sprouted grass shoots and churning the soil surface. This may lead to increased plant species diversity and

reduced soil compaction. Average daily gains on bison on rangelands average approximately one pound per day, compared to approximately 1.3–2.4 pounds per day in feedlot conditions.

One important consideration for managers looking to convert a property to raising bison is that bison perform poorly in digesting coastal bermudagrass and some other introduced forage species. This is primarily a concern in unfertilized monoculture bermudagrass pastures that are found in the southern Great Plains and surrounding regions, but nevertheless may cause severe and chronic issues with animal performance and mortality.

Considerations for Transitioning From Cattle to Bison Ranching

Ranching operations running cattle herds are commonly found across the Great Plains and are typically well suited for transitioning to ranching bison. In many aspects, the two species of livestock require similar operational considerations and facilities, though there are notable differences that should be taken into consideration before transitioning. Comparing the economic feasibility of running bison, tracking local market outlets for marketable animals and changing fencing and handling infrastructure is critical for solvency and long-term success.

ECONOMIC FEASIBILITY OF BISON RANCHING RELATIVE TO CATTLE

The comparative economics of transitioning from cattle ranching to bison is dependent on the revenue prospects from selling higher value animals relative to the increased facility and transportation costs that are required for bison operations.

Overall, the number of bison in the United States has been remaining relatively constant, with recent trends showing an increasing number of bison from 161,917 in 2012 to 183,515 in 2017. Across the Great Plains region, the distribution of these animals has been greatest in the northern states relative to the central or southern ones. Around the same time, wholesale market carcass prices of bison generally outperformed cattle carcass prices from 2009 to 2019 and have outperformed cattle market prices since 2004 ([Bison Economics Tool](#)). However, this increased carcass price is offset by the lack of tax incentives present in the cattle industry, which increases total costs on bison producers.

Converting an existing livestock operation to accommodate bison comes with potentially substantial changes in infrastructure and planning that may impact operational costs. Because of the size and behavior differences relative to domesticated livestock, fences, handling facilities and loading facilities must be strengthened and renovated to accommodate bison. These conversion costs for equipment and perimeter fences may be limiting for many cattle ranchers to transform their properties for conservation, but cost-sharing programs, loans and grants via the USDA may offset some costs. Check with your local USDA Service Center to verify which programs may apply.

Separate from ranch infrastructure, ranchers should be aware that there are fewer bison sale and processing facilities in the country. This effectively means that purchasing bison requires more effort or distance than cattle. While many bison are sold via private treaty, national and regional/state bison associations may organize regular or sporadic auctions. Many traditional sale barns are not equipped for bison. Sale to terminal markets and processors also typically involved an individual contract, with

the producer being responsible for delivering the animals to the facility. Some companies may be able to contract or facilitate the delivery of the animals.



Courtesy: USDA NRCS South Dakota

CONVERTING FACILITIES TO ACCOMMODATE BISON

The two areas that require the most significant adaptation to handle bison are fencing and animal handling facilities. Bison are larger, more agile and more skittish compared to cattle. Their larger size allows them to simply shove their way through fencing, and adult bison can jump up to six feet high. Therefore, they require appropriate facilities and infrastructure that can accommodate those differences.

Fencing

It is important to understand that very few fences will prevent a sufficiently motivated bison from getting through it. Their large size and ability to jump normal-sized fences mean a three-strand, barbed-wire fence good enough for cattle should not be expected to deter or hold bison. Thus, the objective is to utilize fencing and handling techniques designed to reduce the desire for a bison to want to go through the fence and to deter that desire if necessary.

As a rule of thumb, keeping the fence line at the eye level of bison (5–5.5 feet) may deter attempts to cross it. For barbed wire fences, three-to-five strands of high-tensile wire should suffice and may make for straight-forward renovation of existing cattle fencing. For woven wire fencing, 48-inch woven wire topped with two-to-three strands of high-tensile barbed wire may contain bison, while deterring access to pastures by predators (however, this may also unintentionally limit pronghorn, elk and deer

access). Electric fencing can also be effective given good grounding and adequate charge capacity on the lines.

Handling facilities

Like fencing, handling facilities need to be robust enough to handle bison. Compared to cattle facilities, this requires higher pens, fences and panels, with an average height of at least seven feet. Sorting pens need to be larger; chutes need to be larger, and squeeze chutes must be custom made to accommodate the larger width and weight of bison. Specialty squeeze chutes and other handling equipment is available from several manufacturers or can be custom built.

More so than cattle, planning handling facilities to reduce animal stress is critical for bison herds. Placing chutes, alleys and pens with good forward visibility and blocked visibility of humans will allow bison to progress through the facility readily. Excessive stress during handling and leading can lead to animal and human injury, damage to the facilities and potentially animal death.

Programs and Resources

Finally, landowners interested in beginning a bison ranch should be aware that bison do not always qualify for the same incentives and programs that other livestock do. Generally, Bison qualify for USDA Farm Service Agency Wildfire and Hurricane Indemnity Program (WHIP) and Livestock Forage Program (LFP). Within the USDA Natural Resources Conservation Service, their Environmental Quality Incentives Program (EQIP) may be able to aid landowners interested in implementing best management practices. Information on these programs and coverage should be requested from your local [USDA Service Center](#).

Additional Resources & Works Cited

- [National Bison Association](#), Official website.
- [Center of Excellence for Bison Studies](#), South Dakota State University.
- [Bison Worker and Handling Safety Guidelines](#), Central States Center for Agricultural Safety and Health.
- U.S. Bureau of Labor Statistics, 2020. [Consumer Price Index for All Urban Consumers: All Items in U.S. City Average](#) [CPIAUCSL]. *FRED, Federal Reserve Bank of St. Louis*. [Accessed 19 Mar 2020].
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- USDA NASS, 2017. [2017 Census of Agriculture, Census Data Query Tool](#) (CDQT).
- **USDA NRCS, 2021. South Dakota, Natural Resources Conservation Service, [Body Condition Scoring - Bison](#).**