

ARE THERE ANY WILD BISON IN OUR FUTURE?

By Jim Bailey, PhD, Retired wildlife biologist, Belgrade, Montana

Plains bison are the best-known of three species of bison. Other species are the wood bison of central and northern Canada and Alaska, and the European bison. We do not know how many plains bison inhabited North America at the time of European contact. Estimates are there were at least 30 million. Most Americans are familiar with the history of bison abundance and annihilation on the Great Plains. But bison once occurred in all but a few of the United States. Beginning in the 1670s, Spanish journals record bison in the panhandle of Florida. The species occurred from southern New York and the tidewater lands of Virginia, across Texas and a little of Old Mexico, in southern Canada and the Rocky Mountains, and in Oregon and California. However, they appear to have been rare in the arid Great Basin and Columbia Basin habitats of Nevada, Utah and southern Idaho. In 1769, Daniel Boone saw thousands of bison in western Kentucky, and George Washington killed a bison in West Virginia. Perhaps the latter was one of the King's bison, since it was before the Revolution.

Bison in Montana

Most of the year, there are no wild bison in Montana where thousands of the animals once roamed. Each spring, a limited number of bison are allowed to leave Yellowstone National Park and visit Montana. Under current government policy, they must either be eliminated or hazed back into the Park by May 15. About 350 bison at the National Bison Range, near Moise, are a penned semi-wild (or semi-domestic?) herd. Montana law designates them as a "display herd" in an "exhibition pen". The American Prairie Reserve, south of Malta, has about 200 bison. However, these are legally defined as private, domestic livestock.

In the United States, Montana has the two largest, most appropriate areas of mostly public land where wild plains bison may be restored. One includes Montana's portion of the greater Yellowstone area. Currently, bison are restricted mostly to the high-elevation environment of the Park. This range, of the wildest plains bison herd remaining in the USA, should be expanded to include lands at lower elevation – public lands where wild bison are appropriate and private lands where bison are welcome. Another area includes the Charles M. Russell National Wildlife Refuge, the Upper Missouri River Breaks National Monument, and nearby abundant Bureau of Land Management land. However, the management plan for the Wildlife Refuge states that Montana will have to take the first step in restoring wild bison.

Private, Commercial Bison

There are about 200,000 privately owned plains bison in over 4,000 commercial herds in the United States. In these herds, bison are being domesticated and gradually losing the characteristics of wildness that we, including the bison

ranchers, prefer. Herds are managed much like other livestock, with selected culling, skewed sex ratios, forced weaning, vaccinations, vermicides and antibiotics, limited pastures with forced pasture rotation, assisted calving, and supplemental feed and water. Delegating the task of restoring wild bison to commercial producers is an illusion.

Wild Bison

Wildness is the extreme in a continuum from domestic to wild. However, the benchmark of wildness is a preponderance of natural selection. Evolution through natural selection in wild environments gave us wild bison that are alert, efficient, mobile, agile, strong, enduring and disease-resistant. Evolution through artificial selection, and the weakening of natural selection that occurs in small herds, are replacing these wild characteristics of plains bison today.

Admittedly, natural selection can be brutal. Animals starve. Many young and the old are killed by predators. Bull competition for mates results in injuries and even death. Less resistant bison die or fail to reproduce due to disease. This is the process of wildness. We may not remove the harshness without destroying the wildness.

Conservation Herds of Bison

There are 44 conservation herds of plains bison on native range in the USA. These are herds managed by government agencies or owned by the Nature Conservancy or the American Prairie Reserve. The 44 herds have about 17,000 bison. Thirty-eight of these herds have no more than 500 bison and only 4 have more than 1000. Thirty-nine of these herds reside within fences and 1 is on a large island. Almost all these herds are managed with at least some practices commonly used within commercial herds of bison, leading to domestication. Even the Yellowstone Park herd suffers some practices leading toward domestication.

Bison Genetics

Plains bison barely escaped extinction in the late 1800s within Yellowstone National Park and in a few, small private herds where they were crossbred with cattle. Today, cattle genes occur in almost all the remaining bison. There may be only 4 sources of bison without cattle gene introgression – in Yellowstone, in the Henry Mountains of Utah, in Canada, and in a private herd in New Mexico. Herds with high levels of cattle genes have limited value in bison restoration. Herds with low levels of cattle introgression might be purged of undesirable genes if they can be subjected to natural selection in a wild environment.

Small bison herds, less than 400-500 animals, will become inbred. Inbreeding results in poor reproduction, lowered resistance to disease, and other

undesirable traits. Twenty-one of our 44 conservation herds in the USA have no more than 500 bison. Inbreeding is certain in most of these herds.

Genetic diversity is necessary for a population to continue to evolve and adapt to its environment. A bison herd of 2000-3000 animals will lose an estimated 5% of its genetic diversity during every 100 years. Smaller herds will lose even more of their genetic diversity. The process is called genetic drift. It is due to random events that occur during production of ova and sperm, and during the lifetime of each bison cohort. The first 100 years, and more, of this genetic loss in bison are behind us. No plains bison herd had even 1000 animals during most of this time. Today, only 4 conservation herds in the USA exceed 1000 bison and only 2 exceed 2000 bison. Genetic diversity of plains bison is being diminished with every generation of the animals.

We do not leave bison to future generations of Americans. Bison die. We leave the bison genome to future generations. We will not fulfill our obligation to the future until we have at least a few large herds of wild bison on large, diverse natural landscapes where natural selection may determine the bison genome.

Brucellosis and Other Diseases

Brucella abortus is a bacterium causing the disease brucellosis. *Brucella* came early from Europe to North America, probably with Spanish cattle. The disease may occur in several species, but today it is best known in elk, bison and livestock. It causes abortions, mostly with an animal's first pregnancy, and may cause weight loss. In humans, the disease is called undulant fever, which was a serious issue before milk was widely pasteurized. The threat of economic losses due to brucellosis is still a serious issue for livestock producers. Mostly, *Brucella* are transmitted between animals when uninfected animals lick an infected aborted fetus or placenta. There is no clear evidence that bison have transmitted *Brucella* to cattle in wild conditions, though it is likely that this may occur. All recent occurrences of brucellosis in livestock surrounding Yellowstone Park have occurred in herds exposed to elk. Most *Brucella*-caused abortions occur during February and early May. However, most fetuses and placentas are removed quickly by scavenging animals and the bacteria do not persist in the environment, especially as the weather warms. The risk of live bacteria in the environment is near zero by June 15.

In wild environments, wildlife naturally coevolve with their pathogens. Host wildlife become more resistant to diseases and pathogens become less virulent. This process is especially appropriate in Yellowstone National Park which has a mandate to leave Park resources, including natural processes, unimpaired for future generations. Already, brucellosis is not considered a debilitating issue for Park elk or bison populations. Since *Brucella* is widespread in elk and other wildlife and there is no conceivable possibility of eliminating it from the Park, it is a naturalized species that should coevolve in the Park ecosystem. Misguided

attempts to manage brucellosis in Park wildlife will interfere with this coevolution and could have unknown impacts on other host-pathogen relationships. The primary place for managing livestock diseases is in livestock management, not in wildlife management.

For the above reasons, Gallatin Wildlife Association opposes vaccination of Park bison or selective slaughtering of bison that test positive for having been exposed to the disease. Those testing positive may be carrying active infections, or they may have recovered from the disease and may be the individuals most resistant to *Brucella*. We also oppose capturing bison and placing them in crowded pens with artificial feed - as a means to limit the number of bison leaving the Park. This unnatural process exposes bison to increased risks of disease transmission for any of the pathogens they may carry.

Bison Hunting

Let's face it, bison are not like other big game. They are large. They go about in large herds in open terrain. One former Montana governor has described bison hunting as akin to shooting a couch. Bison force us to rethink the meaning and intent of the terms "hunt", and "fair chase". Perhaps "harvest" is a more truthful term. That "hunting" and "chasing" may be minimized in bison harvesting within some environments does not mean that harvesting a bison is valueless.

In the Yellowstone area, bison are habituated to people and have not learned to fear hunters. In contrast, annually hunted bison in the Henry Mountains of Utah are often hard to find and difficult to approach. The behavior of bison in relation to hunting will depend upon their experience and upon the size and topographic and vegetative diversity of their range.

We deplore commercial bison hunting in a pen. If bison are free-ranging within a large and diverse area, a bison hunt will require planning, probably some stalking, careful selection of the sex and age of the quarry, good shot placement, and the effort, cooperation and camaraderie of friends or family to process the large and valuable carcass. These enhance the hunting experience.

Restoring Wild Bison

Restoring wild bison will require some large herds on large, diverse and wild ranges. There will be little gained by establishing any new herd of less than 1000 bison on less than 100 square miles. We already have such conservation herds. In these herds, managing the numbers of bison and limiting their distribution results in loss of genetic diversity and domestication of the species. Larger, more mobile, less intensively managed herds are needed to assure wildness of plains bison.

In the Yellowstone area, we only need to allow some bison to live on ancestral range outside the Park. Much of this land has no cattle, so brucellosis is not an issue. There is public land and private land where bison are wanted. Bison can be fenced out of private land where they are not wanted. This is already happening. Other land has cattle only after June 15 when the risk of *Brucella* transmission from bison is near zero. Intensive management of cattle to control the risk of brucellosis is already necessary in this landscape where elk carry *Brucella*. Managed public and tribal hunting can be used to control both numbers and distribution of bison on this landscape. Public hunting should be used as a tool of wildlife management, not of wildlife annihilation.

Montana Should Lead the Nation

History has given Montana the opportunity to lead in restoring wild plains bison – in the Yellowstone area and surrounding the C. M. Russell National Wildlife Refuge. Some would say this is not an opportunity, but an obligation. Will Montana lead in dealing with the issues and solving the problems, or drop the ball?

Jim Bailey, PhD, Retired wildlife biologist, Belgrade, Montana.

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