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ESSAY: BISON RESTORATION IN THE GREAT PLAINS AND THE CHALLENGE OF THEIR MANAGEMENT

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ABSTRACT—Efforts to save remnant wild bison from extermination have resulted in the establishment of herds on private, public, and tribal lands. Ironically, their successful restoration has evolved into a profitable agricultural industry and a practical alternative to raising domestic cattle. Bison restoration actively managed by humans raises ecological, ethical, and evolutionary questions about whether we are compromising their native ability to function in a grasslands ecosystem. In this essay I examine current bison management practices, conflicting human values about land-use practices, and emerging land-use initiatives focusing on wild bison and ecosystem restoration in the northern Great Plains.

KEY WORDS: bison, grasslands, species diversity, tribal lands, values conflicts

Introduction

The grasslands of the Great Plains extend across 10 states, three Canadian provinces, portions of Mexico, and lands under the jurisdiction of over 60 American Indian tribes. These magnificent grasslands evolved over millions of years under the influence of grazing, fire, and climate (Ostlie et al. 1997) and were stabilized by the equal balancing of vegetation, soil, and climate (Weaver 1968). Bison were the primary grazers until Euro-American settlement (Ostlie et al. 1997; Licht 1997), but cattle and sheep have replaced bison as the dominant grazers (Manning 1995).

Life in these grasslands is often tenuous because of accumulative environmental, economic, and social changes (Great Plains Committee 1936; De Bres and Guizlo 1992). Bison, once nearly extinct, have made an amazing numerical recovery. Yet, the evolution of bison restoration into an agricultural industry (Hudson 1998; Hughes 1998) raises questions about their genetic diversity and whether their innate characteristics as a wild species will be preserved. Population losses among family farmers and

ranchers (Licht 1997; USDA 1999) and population gains among Indian tribes (Hirschfelder and DeMontano 1993; Paisano 1999) raise questions about the future of their ways of life and about how the historic range of bison will be used in the future. Large questions remain concerning the appropriate use of land in a region characterized by aridity, frequent droughts, harsh climate, habitat degradation (Sieg et al. 1999), and large areas with sparse populations. Embedded within each of these questions are a host of interrelated cultural, ecological, philosophical, political, and sociological issues concerning bison, humans, and future land use in the Great Plains which must be addressed in this new century.

Here I focus on bison restoration in the mixed-grass and shortgrass regions of the northern US Plains. My objective is to suggest that bison restoration does not necessarily mean that the bison will survive as a wild species and to demonstrate Plains people have conservation alternatives with which to inspire positive land-use changes for bison and for humans in the Great Plains.

Bison Decline and Restoration

The Great Plains region has been home to a close association between bison and various human cultures for centuries (Wedel 1961; Schlesier 1994). Yet, it has also been the scene of what Roe (1970) concluded was the final extermination of bison as a "free wild species" during the period from 1830 to 1880. Since no scientific survey or official census was taken of the bison population prior to the late 1800s, attempts to identify their numerical presence are historical conjecture. Estimates of the bison population during their peak period range from 25 million (White 1991) to 75 million (Seton 1929). By the last decade of the 19th century, these millions of bison had been reduced to fewer than 1,000 extant animals (Hornaday 1887). By the end of the 20th century, their estimated numbers worldwide had increased amazingly to nearly 300,000 (Fig. 1).

Speculating about their estimated numbers is less productive ecologically than ascertaining the factors affecting their near demise. Over time, the causes have been determined to be more complex than originally thought. White (1991), for example, said "bison were in trouble" by the 1840s, less because of over hunting and more because of drought, habitat destruction, competition from exotic species, and introduced diseases. Isenberg (2000) builds on White's conclusions by giving greater emphasis to the variable grasslands environment as well as to the harvesting and marketing activities

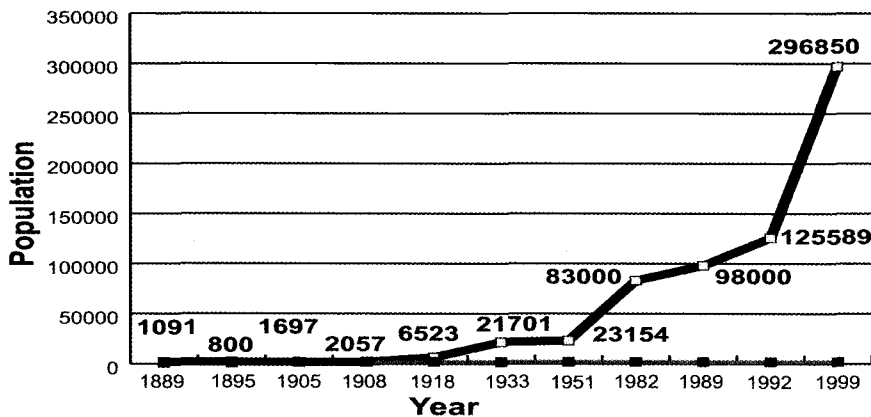


Figure 1. Estimated US bison population, 1889-1999 (data for 1889 in Hornaday 1887; data for 1895 and 1905 in Dary 1974; data for 1908 and 1933 in Garretson 1938; data for 1951-1992 in Danz 1997; and data for 1999 in Albrecht 2000).

of both Indian and Euro-American participants. In short, both Indian and Euro-American actions and policies, together with dynamic physical forces within the grasslands environment, led to the near demise of bison (McHugh 1972; Flores 1991; White 1991; Krech 1999; Isenberg 2000).

This, consequently, brought an end to the way of life for Plains Indians (White 1991) and opened the way for Euro-American agrarian expansion (Limerick 1987). This expansion brought family farmers and ranchers into a land that differed from what most of them had left behind. Their stories of perseverance through uncertain climatic, demographic, and economic times are well documented (Limerick 1987; Malone and Etulain 1989; White 1991; West 1995). Yet some of their accomplishments, and those of their descendants, have often had negative manifestations: drawdown of underground water supplies, soil and water erosion, habitat destruction, and reductions in native fauna and flora (Ostlie et al. 1997). As the nation has become more urbanized and agriculture has become more industrialized, the number of family farmers and ranchers has diminished, much like the members of tribal people or bison herds did a century ago.

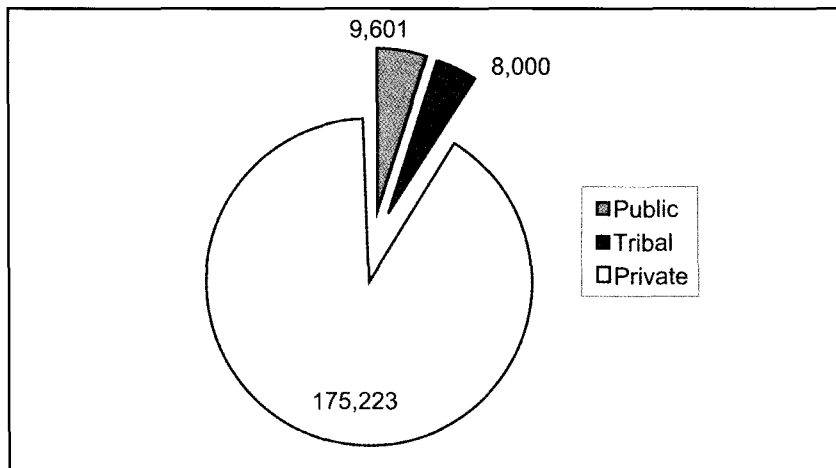


Figure 2. Estimated US bison population in 1999 by type of herd distribution (Albrecht 2000).

More than 100 years after the “dwindling,” as the near demise of the vast bison herds has been called, a remarkable increase in bison population has occurred through the establishment of herds on private, public, and tribal lands (Fig. 2). Examining current bison management practices discloses real philosophical differences among those who raise bison, and it raises justifiable concerns about the loss of species characteristics common to wild bison. My focus here is on private bison herds, because that is where the greatest restoration and growth have occurred in the 20th century.

Bison Management Practices and Loss of Species Characteristics

This section focuses on two primary questions: Are bison in private herds being managed to preserve or to alter their innate, natural species characteristics? What difference do the innate characteristics make? Writer Doug Coffman, who restored the Hornaday Bison Group (Shell 2000), describes those characteristics as “physical structure, physiology, behavior, and species associations which bear directly on their ecological and evolutionary potentials” (Coffman 2000b). Implicitly embedded in this question, and in Coffman’s elaboration, is the premise that preservation of the innate characteristics of bison is important to their future as a wild species. Wild, in simple terms, means having the necessary traits to survive and reproduce under natural conditions in their natural ecosystem (Knowles et al. 1998).

Fred DuBray, executive director for the Pte Hca Ka, Inc., which manages the Cheyenne River Sioux Tribe's buffalo herd, criticizes the practice of raising bison for solely practical reasons, without a spiritual foundation. "There has to be a sense of value," DuBray writes. "There has to be a philosophy behind it, ethics, those sort of things" (DuBray 1993:393). Implicit in this question, and in DuBray's philosophical perspective, is the idea of accountability to the forces that support and sustain all life in the Great Plains: the grass, the soil and the water beneath it, the flora and fauna that enrich it, and the humans who devolve from it.

Of the estimated 175,000 bison currently in private herds in the US, an estimated 114,000, or nearly two-thirds of bison in private herds, are in 10 Great Plains states (Albrecht 2000). Over half of the bison in the Great Plains are concentrated in the northern Plains states of South Dakota, Montana, and North Dakota (Albrecht 1999, personal communication). It is noteworthy that bison were nearly exterminated because they were regarded as an industrial animal (White 1994:247). Their restoration into a practical alternative to raising cattle again makes them an industrial animal, in spite of the commonly cited reasons for making the switch from cattle to bison such as health, economics, environment, and aesthetics (National Bison Association 1993; Callenbach 1996; Hudson 1998; Marchello 1998; Wuerthner 1998; Cournoyer 1999; Albrecht 2000).

As the demand for bison meat and breeder stock has turned bison ranching into a profitable agricultural industry, two types of ranchers have emerged. The first treats bison as a commodity, raises them like cattle, and fattens them on grain. The second treats bison as wild animals and grazes them on grass. Management trends, such as feedlot finishing, dehorning, small herd sizes, skewed sex ratios and selection based on characteristics that alter bison behavior, lead some scientists to say bison are being managed as livestock and, therefore, are well on their way to being domesticated (Hudson 1998; Lott 1998; Schneider 1998). Feedlot finishing creates fears that this technology accelerates genetic alterations for domestication and reduces the healthy advantages of bison meat (Hudson 1998). So far, preliminary research comparing the nutrient content of meat from grass-fed bison to that of grain-finished animals is inconclusive (Marchello 1998; Robinson 2000; Marchello and Driskell 2000). Artificial selection involves manipulating genetic composition in bison from generation to generation; one direction has been to select animals better adapted to humans and to a captive environment (Lott 1998). According to Geist (1996), bison ranching is nothing more than domestication of a wild animal. It makes no difference, he writes, whether bison are altered deliberately or inadvertently, because

ranching makes bison “tractable and a source of products desired by their owner or the marketplace” (1996: 127).

Some bison producers, such as T.R. Hughes, object to the notion of raising bison as cattle. Hughes (1998), for example, favors maintenance of the wild character of bison developed by natural selection and adaptation, and he opposes genetic tinkering and feedlot finishing of bison (Rave 1998). What is needed, he claims, is a “mindset which works to cooperate with nature, utilizing the grassland resources to which these animals are so well adapted” (Hughes 1998).

Conservation biologists Berger and Cunningham (1994) support Hughes’s view that bison raisers need to recognize and maintain the valuable traits of bison as wildlife by cooperating with nature. After studying the behavioral ecology of bison at Badlands National Park in South Dakota, they concluded that “Bison in zoos are not the same as the bison we observed—frisky, aggressive, shy, social, powerful” (1994:xviii). The bison held in captivity and under the control of humans behaved differently than bison that were relatively free to range the grasslands. Yet, bison are often isolated in small herds on small tracts of land, making them captive animals much like those in a zoo.

Zoologist James Shaw (1993) is among those scientists who believe that bison restoration is largely based on five foundation herds and about 77 animals that have evolved through roughly 17 or 18 generations since their near extermination in the late 1800s. However, the genetic evidence suggests that “bison still harbor measurable levels of genetic variability within and between herds” (Shaw 1993). Many scientists have cautioned that low genetic variability, to the extent that it appears, would limit the potential of bison for future evolutionary change (Lacy 1987; Lewin et al. 1993).

Two biological scientists at the University of Alberta say that “genetic variation within and between populations can be affected by population bottlenecks, founder effect, genetic drift and the amount of gene flow between populations” (Wilson and Strobeck 1998:180). A population bottleneck occurred when bison were nearly exterminated. A founder effect, created when a small group of animals are removed from a larger herd to start a new one, bears directly on both private and public herds. Two founder effects have been experienced. The first one occurred when a small number of wild bison were captured to begin private herds (Wilson and Strobeck 1998), and the second founder effect occurred when a small number of animals were taken from private herds to start public herds (Wilson and Strobeck 1998). Genetic drift involves random changes in alleles and occurs

when gene flow via the exchange of animals between populations is restricted. Alleles, according to veterinarian C.W. Seeman (2000, personal communication), are genes that occupy a specific place on a chromosome and determine inheritance.

Isolating bison on small landscapes, where gene flow between isolated groups can occur only through artificial migration and human intervention, further erodes genetic diversity (Berger and Cunningham 1994). Bottle-necks and chance events not only lower genetic variability but also limit the evolutionary potential of bison to adapt to changing conditions because natural selection is inhibited by the loss of rare alleles (Berger and Cunningham 1994). Much more genetic information remains to be collected and analyzed by conservation biologists and geneticists from existing historic and prehistoric records. The healthiest policy to follow as more is learned about genetic variation in bison, according to Trinity University biologist Karen Chambers (1998), is to manage bison herds by avoiding any incidences of nonrandom selection. The compulsion to tinker through selective breeding means that, for each attribute selected, another trait is inescapably lost in the genetic makeup of bison.

Bison also have spiritual, aesthetic, cultural, and ecological benefits. For example, bison have been identified by scientists as a keystone species, one that has a critical effect on the ecosystem (Keeler 2000). This fact is significant for bison management practices because humans who breed animals cannot hope to improve upon four billion years of evolutionary adaptation, that is, nature's genetic engineering. "Wherever we compromise this native ability to function, we correspondingly will reduce both production potential and the long-term health of the ecosystems that support it" (Yorks and Capels 1998:390).

Conflicting Human Values about Land-Use Practices

A central tenet of modern humanistic scholarship, according to historian William Cronon (1995:35), "is that everything we humans do . . . exists in a context that is historical, geographical and culturally particular, and cannot be understood apart from that context." Plains people model well that central tenet, as evidenced in their responses in focus group discussions (Harwood Group 1996) and in public comments on the Northern Great Plains Grasslands Management Plan (USDA 1998). I examined these two venues because they offer special insight into conflicting human values associated with life in rural areas of the Great Plains.

For a brief time in the 1990s a unique organization, the Great Plains Partnership, held the promise of affecting the future of the Great Plains in positive ways. Unfortunately, the organization failed, according to a staff biologist, because of lack of funding, competing priorities, failure to recognize the diversity of the western states, and the inherent complexities of the problems being faced (Kirby 2000, personal communication). One of the outcomes from the Great Plains Partnership was a citizens' report on ecosystems management, based on a series of focus group discussions in eight communities in the Great Plains. This report, "A Way of Life" (Harwood Group 1996), reports four key findings that emerged.

First, ecosystems are seen as intimately connected to the lives of Plains citizens through personal health, livelihoods, values, and the next generation. Second, ecosystem management perplexes them because many land-use practices (e.g., chemical applications to crops) threaten their health and water supplies, yet their way of life depends on these practices. Third, their ecosystem management practices focus on maintaining a way of life, but they believe they are no longer in control of their future, as evidenced by an eroding economic base. Finally, ecosystem management, they believe, ought to be based on the simple ethical code of individual rights and responsibilities (Harwood Group 1996).

Great Plains citizens in these focus groups seemed to have what was called an intuitive sense for how land-use practices and the natural elements affect their lives. On an operational level, however, most seemed uncertain about how to address the paradox of maintaining a way of life without depleting the resources needed to maintain that life. Indeed, they admitted to seldom talking about those ecosystem management tensions. Understandably, it is a threatening topic when they know from the outset that their way of life is at risk; yet, not talking about it may ultimately be even more threatening to their way of life.

Plains citizens, except for Indian people, linked property rights to their ability to maintain a living. Indian people showed a greater desire than other Plains residents to find ways to protect wildlife. Their willingness to call for changes in land-use practices to protect wild species, according to researchers at Haskell Indian Nations University (Pierotti and Wildcat 1997), is attributable to the fact that they typically do not have an immigrant experience within their heritage. Their belief systems and cultures evolved in environments where they "depended upon the animals and plants of these environments for food, clothing, shelter, and companionship" (Pierotti and Wildcat 1997). In contrast, some in the focus groups feared that wildlife

TABLE 1
CONFLICTING HUMAN VALUES REGARDING ECOSYSTEM HEALTH

TOPIC	ARGUMENT	OPPOSING ARGUMENT
Valuing natural resources	Select One Management Approach Grasslands should benefit local economy	Consider multiple options Grasslands should benefit all Americans
Livestock grazing	Increase livestock grazing	Decrease livestock grazing
Oil, gas, and minerals	Mine minerals for national sovereignty	Provide extractive protective measures
Prairie dogs	Control them	Stop killing them
Predators	Selective control	No predator control, restore native predators
Biodiversity	Consider human activities first	Protect and restore native biological communities
Threatened, endangered, & sensitive species	Government overreacts	Restore and preserve habitats for prairie chickens, grouse, prairie dogs, Swift Fox, Mountain Plover, Black-Footed Ferrets, wolves, Western Prairie-Fringed Orchids, bison, etc.

Source: Public comments to proposed Northern Great Plains Grasslands Management Plan (adapted from USDA 1998).

were becoming more important than people and, because of this, people were being put out of work.

Public comments on the Northern Great Plains Grasslands Management Plan (USDA 1998) show that conflicts in human values define land-use issues on public lands in the same way they define issues on private lands. The contents of some 3,100 documents were analyzed by the US Forest Service and categorized into areas ranging from economics to lifestyles to values. Some of the divergent opinions and values related to ecosystem health are represented in the public comments to the proposed grasslands plan (Table1).

The subject of bison reintroduction appeared in numerous comments. Bison restoration was promoted for its potential in bringing northern Plains people together, as an incentive for switching from grazing cattle to bison, and as a prudent and gradual way to benefit the ecological and economic restoration of the grasslands. However, livestock ranchers made emphatically

clear they feared losing a way of life for themselves and their descendants, as they argued for their historic and exclusive right to graze cattle on public lands (USDA 1998).

People living in rural areas of the Great Plains have said new attitudes need to be adopted and new questions need to be asked. Conventional answers to various ecosystem situations no longer suffice for them. A woman in Wichita conveyed the difference well: "The question might be, what is success? Is it the man who saves the grasslands. . . . Or is he a success when he provides for his child to go to school?" (Harwood Group 1996:21) Talking about such questions may enable Plains citizens to avoid further deterioration, or even extinction, of their way of life and the environment that supports it.

Emerging Bison and Land-Use Initiatives

There are signs of hope that wild bison may be able to survive and that Plains people may be able to ecologically restore grasslands ecosystems on the Great Plains. The formation of collaborative organizations based on local economic, environmental, and spiritual conditions, but with nationally appealing standards, is a promising development. I discuss three such organizations, all of which focus on wild bison and ecosystem restoration, because of their potential as conservation models for making desired changes in bison, humans, and land use in the Great Plains.

Montana Big Open, Inc.

The greatest challenge of 21st century bison recovery is to establish wild, free-roaming bison on part of their former range that is both ecologically suitable and large enough for bison to exist as they once did (Scott 1998:360).

Montana Big Open, Inc., is a nonprofit, tax-exempt organization with a scientifically grounded and eloquently interpreted plan to ecologically restore wild bison and the ecosystem of their historic range: 15,000 square miles of mixed-grass and shortgrass lands in east central Montana (Scott 1986, 1998; Coffman 2000b). The term "Big Open" comes from references to Montana's last unfenced rangelands between the Missouri and Yellowstone Rivers (Scott 1998). The concept is the intellectual ancestor of other current proposals to restore large areas of the grasslands flora and

fauna to their natural conditions (Popper and Popper 1987; Valandra 1994; Licht 1997).

The Big Open in this project includes a human population of 2,500 persons and the Charles M. Russell Wildlife Refuge, the UL Bend Wilderness, and sections of the wild and scenic Missouri River (Scott 1998). It is estimated that the Big Open grasslands can support at least 300,000 animal units of native grazers such as bison, elk, bighorn, pronghorn and deer (Scott 1998).

Three factors, in particular, enhance the likelihood for success of Montana Big Open. The first is the adequacy of the ecological, economic, and sociopsychologic research undergirding the project. For example, the sponsors have determined that a restored landscape, together with creative private entrepreneurship, could produce a healthier and more diverse economy than the current marginal and subsidized agricultural economy. The second, and currently the most important factor, is the knowledge, local sensitivities, and perseverance of the sponsors (Scott 1998; Coffman 2000b; Scott 1999, 2000, personal communication; Coffman 2000, personal communication). The third factor is that the size of the project be sufficient in scale to comprise an intact ecosystem—an issue of importance to conserving biodiversity (Ostlie et al. 1997).

In addition to the intended ecological restoration, the project focuses on human revitalization, the most complex and controversial part of the plan. The sponsors face what is a concrete example of the human tendency to resist change and to overuse natural resources for short-term gain, even when they know that by doing so they could be jeopardizing their way of life. Industrial agriculture dominates the economy of Big Open, and government cash subsidies nearly equal net agricultural income (Scott 1998). Scott has observed firsthand that farmers and ranchers who stay on the land like what they do and are unified in their intent to maintain the status quo. Meanwhile, the public at large pays for subsidizing their way of life while grain corporations earn large profits from their produce (Scott 1998).

The commitment to the establishment of a large range for wild bison has been rewarded by some decline in local opposition and increases in land sales that appear to be conservation-oriented. Yet, sponsors are fully aware of what they call the “immediate dangers”: ranches purchased for subdivision or recreational houses, new conversions of grassland to grain production, and the establishment of more commercial bison ranches (Scott 2000, personal communication).

Montana Big Open, Inc., is an instructive source for developing conservation models. In addition to its clearly articulated vision, its strongest characteristics are: (1) a problem-solving approach that challenges local people to participate simultaneously in ecological and economic recovery processes; (2) realistic appraisals of past, present, and future conditions affecting the local population and its physical environment; (3) acknowledgement of human and ecosystem management tensions; (4) respect for the force of private property rights; (5) sophisticated use of developing sciences, such as conservation biology and ecology; (6) minimal role of outsiders, yet a willingness to consider external viewpoints; and (7) recognition of competing ideas for land use.

Great Plains Restoration Council

Deborah and Frank Popper of Buffalo Commons fame (1987) continue their bold thinking about the Great Plains. Their thinking has evolved into an organization, the Great Plains Restoration Council. Its mission "is to restore the ecological health of a significant portion of the North American Great Plains ecosystem, so that all native wildlife and ecological processes exist into perpetuity" (Great Plains Restoration Council 2000b).

The Great Plains Restoration Council (2000a) has instituted what they call the "Million Acre Project," which is based on evidence provided by biologists who say that a reconstructed, fully functioning ecosystem in the Great Plains needs at least one million contiguous acres (Great Plains Restoration Council 2000a). Native wild animals will have at least one "safe zone," a core wilderness area within the one million acres. The Safe Zone may also allow for people on foot, but mostly its purpose is to protect wild animals from extinction and to restore the land. Work is currently being done on a mapping analysis to rank potential areas for restoration based on biological, ecological, demographic and political indicators (Great Plains Restoration Council 2000a). According to a council official, the demographic analysis has been completed and possible sites for further study are in the Dakotas and Montana (Fosha 2000 personal communication). The goal is to have the Million Acre Project and Safe Zone created within the next 10 years (Popper 2000 personal communication).

The completion of the comprehensive mapping work should give the Great Plains Restoration Council a knowledge base comparable to that of Montana Big Open, Inc. However, at this point, its most concrete aspect is its mission to restore the ecological health of one million contiguous acres

for the benefit of wildlife and the ecosystem. Once a site is determined and management plans are in place, it should be possible to extrapolate some general principles to apply to a conservation model for the Great Plains. At this juncture, the Restoration Council appears to lack representation from, and awareness by, ordinary citizens who may or may not be landowners in the Plains. If the council operates as a top-down model, in contrast to the grassroots model of Montana Big Open, Inc., it will have to compensate by reaching out to involve Plains people in substantive ways.

InterTribal Bison Cooperative

Two important mechanisms currently in place are enabling Indian people to revitalize reservation life by integrating economic, educational, environmental, and spiritual aspects of their culture. The first of these is tribally controlled colleges. The second is tribally controlled businesses of which the InterTribal Bison Cooperative is a primary example. Conceptualized in the sacred Black Hills of South Dakota in 1991 and officially formed in 1992, it is a cooperative of over 50 tribes intended to help reintroduce bison to Indian country and to restore the cultural connections between Indian people and bison (Heckert 1993; Human 1998).

The InterTribal Bison Cooperative from the start has been interested in developing a Native American Bison Refuge to serve both as a research and training facility and as an alternative to US land-use practices that contribute to environmental crises, such as the Dust Bowl (InterTribal Bison Cooperative 1993; Valandra 1996). Finding a suitable location for the proposed refuge has been guided by four principles similar in concept to, but smaller in scope than, those of Montana Big Open, Inc. The range acreage for the refuge should be: (1) sufficient in size to sustain a bison population of 500 to 1,000 animals; (2) outside the boundaries of current Indian reservations; (3) large enough to be an intact ecosystem; and (4) part of the historic bison range (InterTribal Bison Cooperative 1993). Genetic diversity within the bison herd and an acreage equivalent in size to a watershed area are also priority considerations (Valandra 1996). Cooperative board member, Edward Valandra, in a paper presented at a national bison conference (2000), identified an area in western South Dakota that satisfies all four principles.

According to an official at the InterTribal Bison Cooperative, little progress has been made toward establishing the refuge. Yet “work continues toward that and other goals that will assist our member tribes in restoring bison to their individual homelands” (White Horse 2000, personal

communication). Certainly, the InterTribal Bison Cooperative can account for many achievements among the tribes. For example, there are 8,000 bison in tribal herds (Albrecht 2000), with the largest herds occurring in the Plains. Restoration of bison on tribal lands is at the center of many cultural and spiritual activities of various tribes. Many donate bison meat for community events, such as sun dances, powwows, and senior citizen programs. Also, special efforts are made to get bison meat to diabetics to help combat the prevalence of that disease among Indian people.

Evidence of the success of its educational programs may be found in the Northern Plains Bison Education Network—"a group of ten tribal colleges collaborating to teach bison management to people who once depended on the animal for food and shelter" (Cournoyer 1999). Tribal colleges are also interested in doing research on bison ecology and on brucellosis. According to Louis LaRose, current chair of the InterTribal Cooperative, tribal colleges will conduct brucellosis research for the sake of bison and not for the sake of domestic livestock (Cournoyer 1999).

The InterTribal Bison Cooperative serves as a unique conservation model because of its authenticity for the people it serves. It has some of the same characteristics as Montana Big Open, Inc., with two essential differences. It is culturally, as opposed to regionally, specific and it uses both scientific and traditional knowledge in its bison restoration efforts. Ecological restoration of the ecosystem appears to be secondary to the restoration of bison for spiritual and cultural purposes.

Summary and Conclusions

As a new century begins, the issue has changed from the extermination of bison to their loss as a wild species through domestication. This powerful wild animal, like the grasslands of the Great Plains that have been their home for centuries, has been weakened by chronic and accumulative environmental disruptions. Long-term sustainability of both the biological species and the ecosystem depends on humans finding a framework for making a living that also restores the Great Plains grasslands. If we can find ecologically friendly and ethically sound ways of living within this ecosystem, then we can surely acknowledge that the interdependency of all life is greater than the economic viability of one way of life. Collaborative organizations, grounded in local conditions and inspired by national appeals, are emerging as potential conservation models for making bison, human, and land-use changes in the Great Plains.

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