

When the U.S. Army managed Yellowstone National Park in the early 1900s, bison conservation management included protection patrols.

Photo courtesy National Park Service

A Bison Conservation History in the U.S. National Parks

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“The significant problems we face cannot be solved at the same level of thinking we were at when we created them.”

— Albert Einstein (1879-1955), attributed

A Conservation History

FROM the agency’s inception in 1916, the North American bison (*Bison bison*) has been an emblematic and crucially important component of the history of the U.S. National Park Service (NPS). Indeed, as a literal reflection of this material relationship and stewardship responsibility, the bison is noticeably emblazoned on the fabric of NPS employee uniforms and insignia. With the creation of Yellowstone National Park in 1872, followed by interim assignment of park management to the U.S. Army in 1886, and successive precedent-setting federal legislation, bison arguably became the first species for which the U.S.

government waged intense neoconservation efforts to prevent extinction in the wild. Direct restoration efforts at multiple parks that began in earnest during the early to mid-twentieth century have been largely successful, although wildlife disease, habitat quality, ecological role, and genetics have emerged as important conservation management issues. Concurrent with these emerging management concerns, the NPS conducts programs and activities that acknowledge traditionally associated cultures and their ties to resources. Thus, the NPS retains unique relationships with a number of Native American tribes who are affiliated with national parks that support bison populations (NPS 1996). Bison conservation management concerns in the national parks during the twenty-first century will continue to include these issues and also likely include increasing mitigation of conflicts with developing adjoining land-use practices.

Near Extinction and Initial Recovery at Yellowstone National Park

The bison of Yellowstone National Park (YNP) solely descend in situ from a remnant, native wild free-ranging population that survived the mass extirpations of the nineteenth century in the United States. Some have suggested that bison historically occupying the headwaters area of the Yellowstone River in Montana and Wyoming were geographically distinct, and thus were not a displaced remnant of the Great Plains bison (Meagher 1973). By the late 1870s, two years prior to the establishment of the park, there are historical accounts of “thousands of buffalo” in and adjacent to areas that would later become the northern and northeastern portions of the park (Schullery and Whittlsey 1992). Yellowstone National Park was established by Congress in 1872, prior to creation of the surrounding states of Montana, Wyoming and Idaho, in part to “*provide against wanton destruction of the fish and game found within said park, and against their capture or destruction for the purpose of merchandise or profit* (U.S.C., title 16, sec. 22, 17 Stat. 32).”

The superintendent’s Annual Report for 1880 reported three distinct wintering herds, even as bison poaching for market meat and hides continued inside the park (YNP 1999). When elements of the First U.S. Cavalry rode into Yellowstone country in 1886, they took charge of the park and immediately began to impose law and order on an unruly landscape (YNP 2000). Poaching remained an important enforcement problem for park managers until passage by Congress of the Lacey Act in 1894 finally provided legal mechanisms to prosecute individuals for killing or transporting federally protected wildlife (Haines 1977). Even so, by 1901, park records show that only twenty-five wild bison remained in the relatively remote Pelican Valley (Meagher 1973). Again, Congress responded in 1901 to protect the Yellowstone bison and allocated funding to restore a thriving bison population to the park. In 1902, eighteen cows were received from the Allard captive herd in Montana and three bulls from the Goodnight captive herd in Texas. For seven years, these reintroduced bison were held in enclosures at Mammoth Hot Springs and Lamar Valley, and were managed to optimize herd production. Beginning in 1910, these bison began grazing open range in summer with supplemental Lamar Valley hay provided during winter, and by the 1920s began to mingle with the remaining wild bison. During the 1930s to early 1950s, bison ranching efforts in the park were phased out; native and introduced bison were allowed to mix and range freely inside the park; and bison were reintroduced into unoccupied habitats inside the park and other state and federal lands (Meagher 1973). By mid twentieth century, the Yellowstone bison had recovered to approximately 1,500 inside the park (YNP 2000).

Bison Restoration at Multiple Parks

Broad popular support for these early bison conservation achievements provided a twentieth century backdrop for successive restoration efforts at additional parks. Following the establishment of Wind Cave National Park in 1903, the Wind Cave Game Reserve was established in 1912 in the Black Hills of South Dakota on fenced portions of Wind Cave National Park and Harney National Forest “*for a permanent national range for bison and for such other native animals as may be placed therein*” (U.S.C. sec. 141b, 37 Stat. 268-293) to be administered by the U.S. Department of Agriculture. Between 1913-1916, a founding herd was established at the reserve, which included fourteen bison received as a gift from the New York Zoological Society through the American Bison Society and six bison received from Yellowstone National Park (Muenchau 2002). During the 1920s and 1930s, despite periodic limited removals, the bison population increased overall, and occupied widening amounts of fenced habitat in and adjacent to the park that had been originally established to protect the underlying caverns (Wind Cave National Park 2002). In 1935, Congress again responded to the popular support for publicly funded bison conservation, and expanded the purpose of Wind Cave National Park to incorporate the Game Reserve (U.S.C. sec. 601, 49 Stat. 378, 383). Historically, bison in the Black Hills probably moved seasonally between forested and prairie habitats, and thus are not thought to have spent the entire year within park boundaries. Today, the entire park is fenced, and the population is maintained within a range of 350-450 animals.

In 1925, the custodian of the Colorado National Monument, outside Grand Junction, Colorado, undertook a partnership with the Grand Junction Chamber of Commerce to raise private funds to introduce bison into the vicinity of the monument from state and local sources. That spring, with financial support from the Colorado Game and Fish Commission and a local buffalo nickel subscription that netted \$150, three bison (one bull and two cows) were received from Yellowstone National Park, likely from the Lamar Valley population (Colorado National Monument 1975). During the 1930s, the Colorado National Monument undertook water developments and fencing to distribute bison grazing across larger areas and limit intermingling of bison with local cattle. The bison population increased to approximately twenty individuals (Capp 1964).

During the early and middle twentieth century, individual bison rarely wandered south from Yellowstone National Park in Jackson Hole, Wyoming. Indeed, except for a few wandering individuals from the Yellowstone River headwaters, bison are thought to have been largely absent from Jackson Hole from near the mid-nineteenth century until the mid-twentieth century. In 1948, twenty bison (three bulls, twelve cows, and five calves) from Yellowstone National Park were transferred

to the State of Wyoming and introduced into the 1,500 acre fenced Jackson Hole Wildlife Park near Moran Junction (Grand Teton National Park 1996). This wildlife park was a private, nonprofit enterprise sponsored by the New York Zoological Society in partnership with the Wyoming Game and Fish Commission as an exhibit of important large animals and a biological research field station for the Rocky Mountain area. In 1950, Grand Teton National Park was expanded to include the wildlife park and much of the Jackson Hole valley as well. By the early 1960s, the park undertook management of the wildlife park's fifteen to thirty bison. Their efforts consisted primarily of winter feeding and rounding up animals that escaped the fenced wildlife park. In 1964, twelve additional bison (six cows and six bulls) were added to the fenced wildlife park from Theodore Roosevelt National Park (Grand Teton National Park 1996). After a mass escape from the fenced wildlife park in 1968, the population remained free ranging inside Grand Teton National Park until the winter of 1976-1977 when the herd wintered on the adjacent National Elk Refuge. Since that time, the population has rapidly increased to near 700 (DeLong 2003) most likely as a result of decreased winter mortality arising from supplemental winter forage provided for elk on the refuge and low predation levels (Grand Teton National Park 1996).

By the mid-twentieth century, two national parks that included substantial amounts of fenced northern mixed-grass prairie habitats were poised to join the efforts of bison restoration on federal lands. As a young man in the 1880s, Theodore Roosevelt came to the Little Missouri badlands of the Dakota Territory (now North Dakota) to ranch cattle and hunt big game, including the few remaining free-ranging Dakota bison (Theodore Roosevelt 1885). Theodore Roosevelt National Park was established in 1947 to preserve the scenic, scientific, historical, and recreational values of the Little Missouri Badlands. In 1956, twenty-nine mixed age and sex bison were secured from Fort Niobrara National Wildlife Refuge, Nebraska, and released into the park's fenced south unit. Afterwards, twenty bison were subsequently translocated into the park's separately fenced north unit in 1962. Today, the park's total bison population is maintained between 500-750 individuals (Oehler 2002).

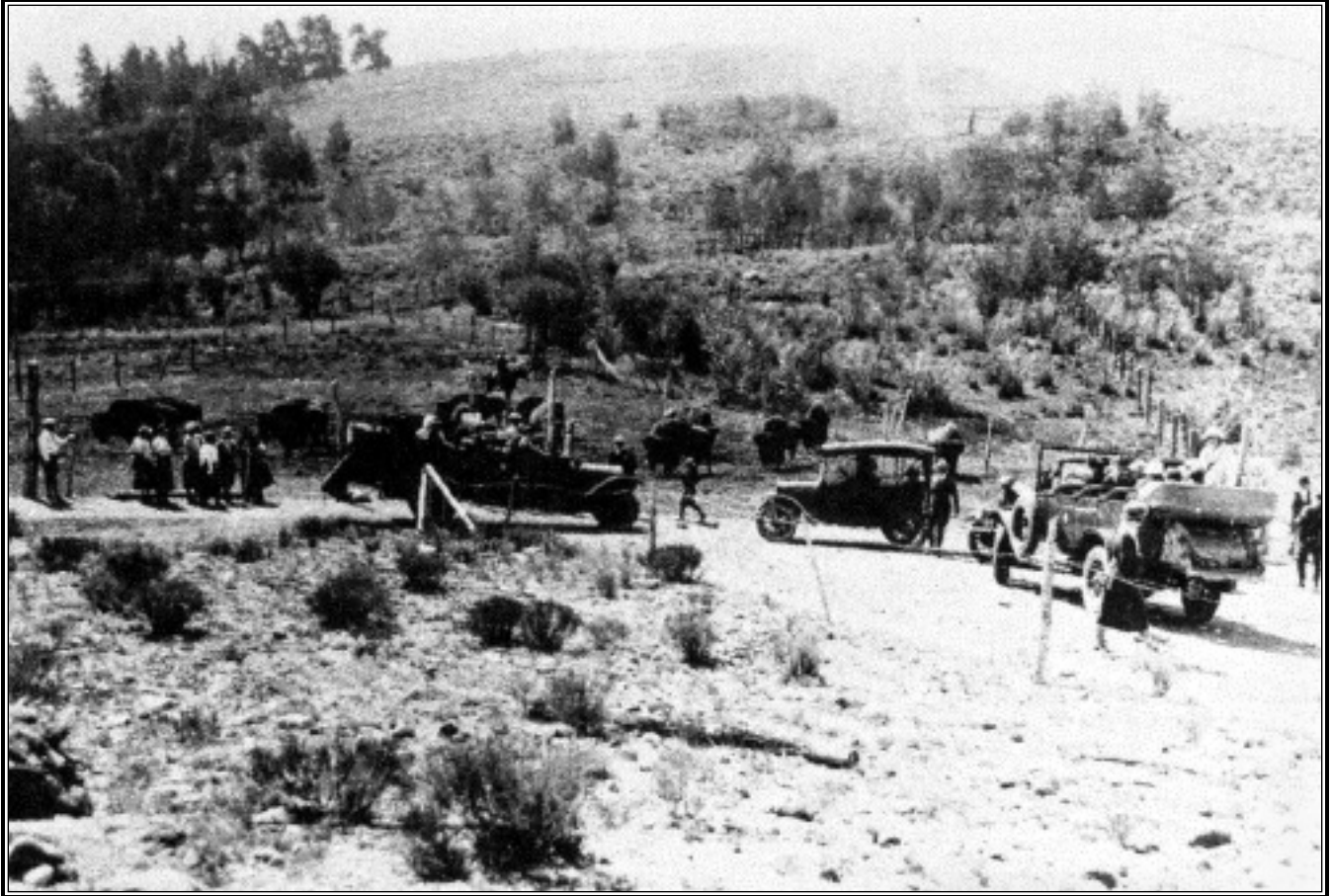
Badlands National Park, located among the mixed-prairie badlands of southwest South Dakota, is the most recent park to participate in a direct restoration effort. This area lies at the headwaters of the White and Cheyenne rivers and substantial numbers of bison historically used the extensive grassland habitats within the park. In 1963-1964, fifty-three bison (fifty from Theodore Roosevelt National Park and three from Fort Niobrara National Wildlife Refuge) were introduced into the Sage Creek Unit of the Badlands Wilderness Area of the then Badlands National Monument. In 1976, the NPS cooperated with the Ogalala Sioux Tribe to add

a portion of the Pine Ridge Reservation to the monument, which was then made a national park in 1978 (Badland National Park 2002). Today, the park's total bison population is maintained between 500-700 individuals.

Conservation Management Challenges of the Twentieth Century

Disease rapidly emerged as a predominant management concern for bison under the stewardship of the NPS. With the likely commingling of bison and cattle when livestock were maintained inside Yellowstone National Park to provide dairy and meat products to early park visitors, diseases of domestic livestock rapidly jumped from domestic livestock to bison, and remain important conservation management concerns. Between 1911-1922, several outbreaks of hemorrhagic septicemia occurred in Yellowstone bison, killing between 9-15 percent of the introduced herd (Skinner and Alcorn 1942-1951). The bacterial bovine disease brucellosis (*Brucella abortus*) was detected in bison at Yellowstone National Park in 1917 (Skinner and Alcorn 1942-1951), and has since remained chronic with seroprevalence rates near 40-50 percent. During the mid-twentieth century, the NPS attempted mitigation of chronically brucellosis-infected bison herds at Wind Cave and Yellowstone National Parks with mixed success. Between 1946-1985, Wind Cave National Park, with a captive bison population within the entirely fenced park, conducted forty years of vaccination, direct population reduction through shooting in the field, and capture/disease test/slaughter of seropositive bison. At times, these actions reduced the population to near 200 individuals prior to eradicating brucellosis (Muenchau 2002).

Similar management tactics occurred at Yellowstone National Park during the 1950s and 1960s, with a free-ranging bison population distributed across more than 1 million acres of unfenced mixed-conifer forest and montane grassland. This resulted in a dramatic population decline from approximately 1,500 to near 200 bison by the winter of 1965-1966, with seronegative animals still being detected (YNP 2000). At this time, park managers decided to cease these management tactics after it became apparent that eradication of brucellosis could well entail elimination of wild and free-ranging bison. Arising from continuing conflicts with the State of Montana over bison moving outside the park, the USDA Animal and Plant Health Inspection Service, USDA Forest Service, and National Park Service recently completed an Environmental Impact Statement for an Interagency Bison Management Plan (IBMP) for the State of Montana and Yellowstone National Park (NPS 2000). Montana subsequently adopted the IBMP for joint-implementation. This long-term joint federal-state bison management plan is not a disease eradication plan, but rather incorporates a suite of management tactics



Park visitors viewing captive bison at Yellowstone National Park, 1920s.

Photo courtesy National Park Service

designed for long-term disease transmission risk-management, while concurrently increasing opportunities for bison to occupy historic winter ranges adjacent to the park during winter when cattle are not present.

Between fifteen and thirty bison were maintained at the Jackson Hole Wildlife Park until brucellosis was discovered in the herd in 1963 (Grand Teton National Park 1996). Within months, all thirteen adults were destroyed, and only nine vaccinated calves and yearlings were retained. This herd was then supplemented with twelve disease-free bison from Theodore Roosevelt National Park in 1964. Between 1969, with the inauguration of a free-ranging condition in Grand Teton National Park, and 1991, brucellosis reemerged as a chronic disease with a seroprevalance rate of 64-88 percent (Williams *et al.* 1993), likely due to winter commingling with brucellosis infected elk. Grand Teton National Park is also currently engaged in joint planning for an environmental impact statement to address long-term joint federal-state bison and elk management in Jackson Hole. Theodore Roosevelt and Badlands National Parks initiated bison restoration efforts with brucellosis-free bison, and this disease is not a conservation management concern at these parks.

Wildlife habitat quality also emerged as an important driver of park bison management decisions. As early as

the 1920s, Yellowstone National Park managers began to respond to concerns about overpopulation, and suggested that a law be passed to authorize the disposition of surplus bison, with such authority granted by Congress in the 1923 Appropriations Act (Meagher 1973). Citing concerns about overgrazing and declining park rangeland condition, the Yellowstone bison population was periodically reduced by shooting or slaughter, or was shipped to numerous public parks, zoos, and private estates for exhibition and herd expansion. Periodic herd reductions citing concerns about rangeland condition continued at Yellowstone National Park until 1967 (Meagher 1973).

During the 1940s to 1970s, potential overgrazing at the Colorado National Monument prompted park managers to periodically reduce the herd size through capture or shooting. Park managers eventually decided to remove the entire bison population in 1983, responding to growing concerns about conservation of the monument's vegetation communities (Crowell 1983). That year, after testing negative for brucellosis, all twenty-six remaining Colorado National Monument bison were shipped to Badlands National Park. The three Dakota parks (Wind Cave, Badlands, and Theodore Roosevelt National Parks) continue to manage bison within completely enclosed areas, and periodically capture and

remove some bison to maintain populations near the estimated rangeland vegetation or water carrying capacities. All three of these parks provide live bison to affiliated Native American tribes.

Bison management in national parks has also generated concern about population genetic integrity. A recent study has inferred that, although there are varying levels of cattle genetic introgression in many North American bison (arising from early cattle cross-breeding attempts), the bison of the greater Yellowstone area and three Dakota parks show no genetic hybridization and are genetically pure (Templeton 2003, Ward *et al.* 1999). The relative importance of other aspects of genetic integrity (e.g., reproductive fitness, disease resistance, heterozygosity, etc.) continue to be discussed among park managers. Although bison went through a tremendous genetic bottleneck at the end of the nineteenth century, there are few, if any, deleterious expressions of genetic inbreeding in genetically pure NPS bison, and at this time there is no comprehensive program of genetic intermixing among the national parks.

Throughout the twentieth century, the ecological role of bison in national parks had been indirectly and directly acknowledged, but received important scientific attention only after initiation of long-term studies of bison at Yellowstone National Park (Meagher 1973). As the largest quadruped in North America, bison play important ecological roles in national parks as a strongly socially organized large herbivore (e.g., grazing and urine/dung deposition patterns) and through physical disturbances such as trampling, wallowing, and rubbing of woody vegetation. They also serve as a carrion base for numerous mammals, birds, insects, and other agents of decomposition (YNP 2000), and as an emerging prey base for gray wolves in Yellowstone and Grand Teton National Parks (Smith *et al.* 2003).

An intriguing NPS bison management issue has recently emerged at Grand Canyon National Park, with some bison opportunistically entering and occupying portions of the park from adjacent private and federal lands (Leslie 2002). These are descendants of bison that were first introduced into the southern Colorado Plateau in 1906 by C. J. "Buffalo" Jones and Uncle Jimmy Owens in an attempt to create a ranch of crossbred cattalo. When that failed, Owens attempted to donate the bison to the park, but instead the bison ended up occupying the fenced House Rock Valley Wildlife Area under a Memorandum of Understanding between the State of Arizona and the U.S. Forest Service. In 2000, approximately ninety bison left through the unmaintained fence surrounding the Wildlife Area and occupied portions of the park (Leslie 2002). Mead (2002) undertook an overview of bison history in Grand Canyon National Park, and found that historical evidence is, at best, inconclusive as to whether bison were native to the park during the later Holocene. By the time of Spanish contact (circa 1540), bison were not

present in the surrounding greater Grand Canyon area (Mead 2002).

Cultural Importance of Bison Conservation in National Parks

Accounts among some Plains cultures, particularly the Lakota Sioux, relay that when the buffalo came out of Wind Cave, they transformed into humans (Walker and Jahner 1983). Buffalo, then, are considered the progenitors and therefore relatives of some American Indian tribes. In return for the gift of being brought to life on this earth, Native American descendents have the responsibility to act as stewards toward the "Buffalo Nation" of whom they are a part. Historically, buffalo were the great providers of life, that is, of food, shelter, clothing, and ceremonies. This spiritual covenant and the integral way buffalo were woven into the cultures of tribes are primary motivating forces in the restoration of bison to tribal lands, leading to a reinvigoration of cultural (including spiritual), economic, and social well-being.

A quiet revolution is taking place in Indian Country, and the restoration of bison from parks to tribal lands is playing a pivotal role. In 1992 the Three Affiliated Tribes (Arikara, Hidatsa, and Mandan) entered into a memorandum of agreement with Theodore Roosevelt National Park to receive bison (TRNP, unpublished, 2000). To date, over 900 bison have been distributed to the tribes, who then have redistributed about 50 percent of these bison to other tribes (Gary Kiramidjan, Chief Ranger, Theodore Roosevelt National Park, Medora, ND, personal communication, June 2003). Over the past ten years, a collective, known as the Intertribal Bison Cooperative (ITBC), has coordinated transportation of thousands more bison from the three Dakota prairie national parks and several National Wildlife Refuges to American Indian tribes. Today more than fifty tribes across the country have communally owned bison herds (Tony Willman, Technical Services Provider, InterTribal Bison Cooperative, Rapid City, SD, personal communication, June 2003).

Some tribes are also attempting to manage bison more like wildlife and less like livestock. When the carrying capacity of existing acreage is reached, some tribes are acquiring new lands in order to expand the size of their herd, and simultaneously increase the size of their reservation homeland. Owning a herd stimulates awareness of each community's particular cultural legacy relayed through generations with traditional ceremonies often celebrating the return of bison to tribal lands. When bison are killed, whole communities become involved through respective tribal ceremonies and the distribution of meat among tribal members in need (particularly the sick and elderly) (Williams 2002). Although live bison are not distributed from Yellowstone National Park due to chronic brucellosis, a carcass distribution program through the IBMP provided the meat,

heads, and hides of 184 bison to 14 different tribes in 2003 (Janice Finn, Montana Department of Livestock, Helena, MT, personal communication, June 2003). Tribes that have bison herds analogize the stresses of captivity on bison to the social distresses experienced among Indian families and communities (Carlson 2002). Indeed, among those tribes restoring bison herds, a clarion call is being made to likewise restore the social health of American Indian people.

The bison herd at Yellowstone National Park holds special significance to many American Indian tribes. This was reflected in the responses of more than 120 Native American tribes, organizations, and individuals to the IBMP planning process (YNP 2000). Many Native Americans regard the Yellowstone bison population as the last living link with the indigenous wild and free-roaming herds of North American bison on a historic range. Consequently, this population contains the direct descendents of progenitors who brought native peoples onto this earth (Eagle Bear 2002). Many Native Americans also view the Yellowstone bison as inextricably linked to their existence and survival as indigenous peoples, and thus, ask that federal and state governments acknowledge the historical and cultural relationship with demonstrated understanding of their unique filial relationship (Dubray 2002).

Conservation Management Revisited

There is no precise total number of bison but many experts agree that there are approximately 400,000 bison in North America (*Bison bison*) and 4,000 bison in Europe (*Bison bonnassus*). Few bison now remain as free-ranging wildlife, and approximately 98 percent of all North American bison are propagated under captive (fenced) management programs, most often with food and fiber outcomes. Recent advances in bison genetics show that many of the North American bison are in fact bison-cattle hybrids (Ward *et al.* 1999, Templeton 2003). It has been 130 years since the last expansive free-ranging populations were eliminated in North America, and now only approximately 7,500 North American bison remain in an unfenced, wild, and free-ranging condition, with approximately 4,500 or 60 percent located in two U.S. national parks in the greater Yellowstone area. Indeed, the core habitat for all remaining free-ranging bison is maintained in national parks and equivalent protected areas. Unlike many other species of native North American wild mammals, free-ranging bison most frequently receive little tolerance on private or other public lands. During the later half of the mid-twentieth century, a North American philosophy for wildlife management became organized at local, state, and federal levels around three primary objectives: (1) to develop and sustain maximum game populations consistent with available habitat, (2) to ensure maximum production and utilization of annual game surpluses, and (3) to provide the maximum possible amount of recre-

ational opportunities for sportsmen (Mackie 2000). Why, then, have bison, in contrast to all other native large herbivores in North America (elk, moose, bighorn sheep, pronghorn, deer, mountain goat, caribou, and muskoxen), failed to gain a legitimate station as free-ranging wildlife, according to these same wildlife conservation management philosophies on the vast array of suitable public and private lands? The emblematic bison doctrine that has been perfected in the past century now dominates our collective, and sometimes selective, memory and conscience. Extension of the grace we provide to other native wildlife towards the conservation of wild, free-ranging herds of this, the largest, terrestrial mammal of North America and Europe, will continue to be constrained by both real and perceived conflicts. Until we envision and implement new possibilities, some national parks and equivalent protected areas will remain the sole places where bison as truly free-ranging wildlife, can be experienced.

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Glenn Plumb received his Ph.D. in 1991 from the University of Wyoming after studying the foraging ecology of bison in the mixed-grass prairie of South Dakota. When not struggling to master classic guitar rock in open E tuning or raising three lively teenagers at the end of the road, he serves as the wildlife program manager at Yellowstone National Park. Pictured with remains of a wolf-killed, grizzly bear-scavenged cow bison at Yellowstone National Park.



Rosemary Sucec received her M.A. from the University of Colorado in 1999 after studying the formation of ethnic identities in a 19th century American Indian community. She has conducted ethnographic and ethnohistorical research for the NPS, and at Yellowstone National Park regularly hosts and communicates with the park's 26 associated and 54 bison-interested tribes. Pictured left to right with members of the Nez Perce Tribe (Rosemary, Allen Pinkham, Vera Sonneck, and Beatrice Miles) at Yellowstone National Park.