

## Why Yellowstone Bison Are Threatened or Endangered with Extinction

### What is the conservation status of bison as a wildlife species?

Since 2008, the International Union for Conservation of Nature has Red Listed the bison as “Near Threatened.”<sup>1</sup>

In Montana, Fish, Wildlife, and Parks and Montana Natural Heritage Program lists bison’s status as S2: “At risk because of very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to global extinction or extirpation in the state.”<sup>2</sup>

“Today, the plains bison is for all practical purposes ecologically extinct within its original range.”<sup>3</sup> Dr. Curtis H. Freese.

### What makes Yellowstone bison unique?

“The Bison of Yellowstone National Park are unique among bison herds in the United States, being descendants, in part, of the only continuously wild herd in this country.”<sup>4</sup> Dr. Margaret Mary Meagher, retired Yellowstone National Park bison biologist.

“Yellowstone National Park is the only place in the lower 48 States where bison have existed in a wild state since prehistoric times. Bison occupied the region encompassing the park from shortly after recession of the last glaciers 10,000 to 12,000 years ago, until the 19th century when they came close to extirpation.”<sup>5</sup> C. Cormack Gates Ph.D., University of Calgary.

### What makes Yellowstone bison significant?

No other plains bison population is as important to the survival of the species as the Yellowstone bison. The extirpation of the Yellowstone bison would represent the complete loss of genetically-intact, wild bison from the last stronghold of their historic and ecological range, loss of unique ecological adaptations to the local environment, and the loss of other valuable and unique genetic qualities.

Yellowstone’s geothermal features influence bison habitat and bison behavior by providing thermal refugia within the park. The inclusion of geothermal areas as a significant portion of habitat use represents an unusual ecological adaptation unique to the Yellowstone bison population.<sup>5</sup>

The portion of the northern Greater Yellowstone ecosystem occupied by Yellowstone bison is the only place where natural patterns of population structure and gene flow in plains bison can be observed.<sup>6,8</sup> Using mitochondrial DNA extracted from bison fecal samples, Gardipee (2007) found evidence of population structure and female philopatry to breeding territories. Female bison returning to breed at or near their place of origin is a behavior that has not been documented in any other wild bison population.<sup>7</sup>

Halbert *et al.* (2012) demonstrated the existence of two genetically distinct subpopulations of bison within Yellowstone National Park that showed longitudinal differences in migration patterns.<sup>8</sup>

### What makes Yellowstone bison discrete?

The Yellowstone bison are not just geographically isolated from other bison but have been physically isolated from other bison populations for over 100 years.

## **Existing regulatory mechanisms are inadequate in protecting the wild migratory species.**

Regulatory mechanisms provide the necessary assurances that essential habitat needs will be addressed and that long-term habitat protections for a species are in place.

Within the boundaries of Yellowstone National Park, bison management includes hazing, capture, and culling. Under a 2000, court-mediated settlement, the Secretaries of Agriculture and Interior and the Governor of Montana signed an agreement that limits bison abundance and distribution in Montana by culling bison that venture near the Park boundaries . . . these actions by the National Park Service are resulting in differential impacts to sub-populations, and are preventing the Yellowstone bison from moving out of the Park into important winter range.

The United States Forest Service administers most of the public land that provides Yellowstone bison habitat outside the Park. Although bison are extremely rare in both Forest Service regions, are designated Near Threatened on the IUCN Red List, are a species of national interest, are the subject of great controversy, and are clearly impacted by agency actions such as the issuance of livestock grazing permits and other activities in bison habitat, neither Region 1 (which includes Yellowstone bison habitat in Montana and parts of Idaho) nor Region 2 (which includes Yellowstone bison habitat in Wyoming) consider bison to be a sensitive species or a species of conservation concern.

State wildlife officials in Montana and Idaho have lost most of their jurisdiction over wild bison to their livestock counterparts, who are treating these bison as diseased domestic livestock (Keiter 1997).<sup>9</sup>

## **What threatens the habitat of Yellowstone bison?**

Historically, within the northern Greater Yellowstone Ecosystem bison ranged across some 20,000 km<sup>2</sup> in the headwaters of the Yellowstone and Madison rivers. The current occupied range is approximately 3,175 km<sup>2</sup> (Plumb *et al.*, 2009) or about 16% of the historical range.<sup>10</sup>

Livestock and livestock grazing management directly and indirectly impact bison and their habitat. Livestock directly affect vegetation structure, alter plant communities, alter soil characteristics, and impact other habitat elements (e.g. Fleischner, 2010). Public lands livestock grazing requires developments such as fencing, cattle-guards and roads to control livestock movements. These range developments impair bison movements and distribution. The proximity of livestock poses a significant threat of disease transmission to free-roaming bison.<sup>11</sup>

Continued livestock grazing on bison habitat on public lands promotes the perceived need for disease risk-management operations such as those occurring under the guidance of the IBMP. Unfortunately, rather than managing domestic cattle to avoid bison habitat, the agencies instead manage bison out of its habitat all to benefit powerful livestock industry interests.

Extensive amounts of land within the northern Greater Yellowstone Ecosystem are unprotected and threatened by land use intensification, policies such as zoning are needed that can affect large areas including regionally coordinated growth management efforts to preserve biodiversity by redirecting future development (Gude *et al.*, 2007). The same authors conclude, "Future habitat conversion to exurban development outside the region's nature reserves is likely to impact wildlife populations within the reserves."<sup>12</sup>

## **Yellowstone bison are being over-utilized for Commercial, Recreational, Scientific, or Educational Purposes.**

In order to benefit the livestock industry, Yellowstone bison using winter ranges at Park boundaries are subject to disease risk management operations conducted under the guidance of current IBMP. These

actions, driven by commercial interests perturb the current population substructure (Halbert, 2003; Gardipee, 2007; Freese *et al.*, 2007; Halbert *et al.*, 2012).<sup>13, 7, 3, 8</sup>

According to publicly-posted state records, 790 Yellowstone bison have been killed since the State of Montana allowed bison hunting in 2005. This included 343 in the Gardiner area and 275 at West Yellowstone.<sup>14</sup>

The agencies have made no attempt to determine the herd origin for these hunt killed animals. However, since the Northern range bison tend to leave the Park at Gardiner whereas the Central range bison migrate through both portals, the smaller Central range bison herd clearly bears the brunt of the hunting take. This contributes to the disproportionate culling of genetically distinct breeding herds that is currently fostered by IBMP management operations.

### **What livestock diseases threaten Yellowstone bison?**

The American Bison Specialist Group recognizes nine federally listed diseases of concern for bison conservation in North America: anaplasmosis, anthrax, bluetongue, bovine spongiform encephalopathy, bovine brucellosis, bovine tuberculosis, bovine viral diarrhoea, Johne's disease, and malignant catarrhal fever (sheep associated) (Gates *et al.*, 2010). Of these, hemorrhagic septicemia (outbreaks have occurred in the past), malignant catarrhal fever (outbreaks of which have occurred in the region), and bovine brucellosis (with which Yellowstone bison suffer chronic infection) pose the most immediate threats to Yellowstone bison.<sup>15</sup>

### **What other natural or manmade factors threaten the existence of Yellowstone bison?**

The IUCN cites a number of serious threats to the conservation of plains bison such as: habitat loss; genetic manipulation of commercial bison for market traits; small population effects in most conservation herds; lack of exposure to a full range of natural limiting factors; cattle gene introgression; loss of genetic non-exchangeability through hybridization between bison subspecies; and the threat of depopulation as a management response to infection of some wild populations hosting reportable cattle diseases. In particular, the IUCN cites culling of bison populations to prevent spread of bovine diseases as a major threat to their conservation.<sup>1</sup>

Genomic extinction poses one of the most imminent threats to bison conservation. Bison are at extremely high risk of genomic extinction because of domestication and anthropogenic selection, and hybridization with cattle (Freese *et al.* 2007). More than 95% of bison exist under private ownership and are subject to agricultural practices which promote anthropogenic selection for traits to meet the market standards of the commercial bison industry (Freese *et al.*, 2007). There is widespread evidence of hybridization with cattle among private bison herds. Selection for particular traits which may be conferred by cattle alleles has the potential to increase current levels of introgression (Ward *et al.*, 1999; Halbert, 2003; Halbert *et al.*, 2005; Freese *et al.*, 2007; Halbert and Derr, 2007). Evidence of hybridization with cattle has now been found in all major conservation herds except for the Yellowstone bison. As such, the Yellowstone bison are the last remnant of genetically intact plains bison.<sup>3, 16, 13, 17, 18</sup>

Human activities have led to large increases in the atmospheric concentration of heat-trapping gases, which is changing the climate in Greater Yellowstone. According to Saunders *et al.* (2012) in Greater Yellowstone, the last decade was 1.4°F above the region's 20<sup>th</sup> century average. Summer temperatures in Greater Yellowstone have gotten hotter by an even larger margin, with the summers of the past decade 2.3°F above the average for 20<sup>th</sup> century summers. Yellowstone National Park has documented that precipitation has been declining as temperatures have been increasing (Yellowstone Center for Resources, 2013). Thus as the climate dries, more bison will move out of the park.<sup>19, 20</sup>

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Excerpts from the Petition to List the Yellowstone Bison as Threatened or Endangered Under the Endangered Species Act, and additional supporting material compiled by Buffalo Field Campaign PO Box 957 West Yellowstone MT 59758 (406) 646-0070 [www.buffalofieldcampaign.org](http://www.buffalofieldcampaign.org) November 12, 2014.