

## **Questions and Answers for the Plains Bison 90-day Finding**

### **What are the conclusions of the U.S. Fish and Wildlife Service regarding the petition to list the wild plains bison?**

The Service completed a 90-day petition finding for the wild plains bison. After evaluating all of the scientific information described or cited in the petition and information readily available in our files, we concluded that the petitioners did not provide substantial information indicating that listing may be warranted under the Endangered Species Act (ESA). However, we will continue to work with our partners to conserve and protect wild plains bison throughout its remaining range.

### **What is a 90-day finding?**

A 90-day finding is an initial review to determine whether or not a petition presents substantial information indicating that listing might be warranted under the ESA, thereby necessitating a full status review of the species. The standard for “substantial information” is the amount of information that, when reasonably viewed in light of all information available in the petition and in our files, tends to show that the listing action may be warranted.

### **What specifically does the Service look at to determine if listing may be warranted?**

We conducted an analysis of the information the petition provided regarding the five factors specified in the ESA. The five factors include: (A) present or threatened destruction, modification or curtailment of a species’ habitat or range; (B) overutilization for commercial, recreational, scientific or educational purposes; (C) disease or predation; (D) inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting a species’ continued existence. The petitioners did not present substantial information, nor did we have any available in our files, indicating that listing the wild plains bison may be warranted based upon any of the five listing factors. The primary stressors that we evaluated included present or threatened habitat loss, brucellosis, federal and state regulatory mechanisms, genetic diversity, introgression with cattle genes, and climate change.

### **If the species is not warranted for listing, does this mean that conservation efforts are less important?**

No. The bison represents a unique part of our country’s natural heritage, and we will continue to implement conservation efforts to ensure its status continues to be stable or improving. It is due to conservation efforts that the species has sustainable populations. For more on the conservation actions being implemented, see the question below on regulatory mechanisms.

### **What do plains bison look like?**

Bison are the largest native terrestrial mammal in North America. A mature male plains bison typically weighs 1,200-2,000 pounds. Bison are brown, with longer hair over the forehead, neck, shoulder hump, and front-quarters. Both sexes have short, black horns that are never shed. Female bison typically breed as two-year-olds and may breed until at least 16 years of age, although they may not breed in every year. One calf is typically born in mid-April through May. Males do not usually breed until age six. Bison graze on grasses and sedges throughout the year.

### **Where are plains bison found, and how many are there?**

Historically, plains bison were most abundant on the Great Plains, but their range extended from central Canada to northern Mexico and nearly from coast to coast. Historical estimates regarding numbers of plains bison are 30-75 million. Plains bison were eliminated west of the Rocky Mountains and east of the Mississippi River by the early 1800s, largely by hunting. At the close of the Civil War, plains bison probably still numbered in the tens of millions. Intensive market hunting for hides and meat occurred in the late 1800s; and by 1889, an estimated 285 wild plains bison remained in Colorado, the western Dakotas, Montana, the Texas Panhandle, and Wyoming, as well as 256 animals in captive herds.

Today, plains bison occur in parks, preserves, other public lands, and on private lands throughout and external to their historical range. Recent population estimates range from 400,000-500,000 individuals, with approximately 20,500 animals in 62 conservation herds and the remainder in approximately 6,400 commercial herds. Population trends appear stable to slightly increasing in recent years for plains bison in conservation herds and increasing in commercial herds.

### **What is the difference between a commercial herd and a conservation herd?**

Commercial herds are typically managed by private entities for the production of meat and other commodities. Conservation herds are typically managed by governments and environmental organizations for the purpose of conserving the plains bison as wildlife in its native ecosystem. Our interpretation of the ESA is that it intended to conserve species in their native ecosystems. We do not believe that bison propagated and managed for commercial uses aid in the conservation or recovery of plains bison in the wild. Therefore, for the purposes of this finding, we analyzed plains bison in conservation herds only.

### **How has habitat loss affected the plains bison?**

Historically, bison habitat was lost primarily due to conversion to cropland and development of grazing land for cattle. However, suitable habitat remains available today to accommodate the expansion of existing herds and establishment of new herds, particularly on federal and Tribal lands. We do not have information indicating that present or potential future impacts to habitat are a limiting factor for plains bison.

### **How has overutilization affected the plains bison?**

There was a dramatic historical decline in plains bison due to market hunting and, to a lesser extent, subsistence hunting and recreational shooting. However, market hunting ended in 1884 and is no longer an issue. Limited regulated hunting currently occurs on three public herds in the contiguous U.S., four herds in Alaska, and five herds in Canada. Overutilization is no longer a limiting factor for plains bison.

### **How has brucellosis impacted the plains bison?**

Brucellosis is an introduced bacterial infection that occurs in cattle, bison, and other mammals. Brucellosis has been eradicated from all commercial herds and most conservation herds in the U.S. through improved management. Plains bison and elk in the Greater Yellowstone Area are the last remaining reservoirs of the disease in the U.S. Brucellosis has only marginal direct impacts to plains bison, but can potentially impact the species indirectly by the potential risk posed to the livestock industry. Transmission from bison to cattle has been demonstrated in captive studies, but there are no confirmed cases of transmission in the wild. The Departments of Interior and Agriculture developed an interagency management plan in 2000 to maintain a wild population of bison within Yellowstone National Park, while protecting the Montana livestock industry. The plan incorporates hazing, spatial and temporal separation, vaccination, and, when necessary, the capture, test, and slaughter of bison that test positive for brucellosis. Recent stable to increasing population trends in plains bison indicate that brucellosis is not a limiting factor.

### **What regulatory mechanisms are in place to protect the plains bison?**

Plains bison are federally managed via the aforementioned Interagency Bison Management Plan for Yellowstone National Park, the Department of Interior's Bison Conservation Initiative, the U.S. Fish and Wildlife National Refuge System, and the U.S. National Park Service. The Bison Conservation Initiative provides a framework for managing plains bison on Department of Interior lands that includes restoring bison on appropriate landscapes, promoting genetic diversity, controlling contagious diseases, and working with other interested parties. The National Refuge System promotes bison conservation as one of its priorities. Currently, eight National Wildlife Refuges (NWR) in the contiguous U.S. incorporate bison management into their programs (C.M. Russell NWR, Fort Niobrara NWR, the National Bison Range, the National Elk Refuge, Neal Smith NWR, Sullys Hill National Game Preserve, Rocky Mountain Arsenal NWR, and Wichita Mountains NWR). Five National Parks also include bison management in their programs (Badlands NP, Grand Teton NP, Theodore Roosevelt NP, Wind Cave NP, and Yellowstone NP).

In addition to federal cooperative efforts to conserve existing herds and establish new herds, several state governments and private entities participate in restoration of the plains bison. State managed conservation herds exist within the species' historical range in Arizona, Kansas, Minnesota, Missouri, Nebraska, South Dakota, Texas, Utah, Wisconsin, and Wyoming. Additional state herds external to the species' historical range exist in Alaska.

We believe that existing regulatory mechanisms adequately support conservation and restoration of plains bison.

### **What is the legal status of plains bison?**

Plains bison are legally designated as either wildlife or domestic livestock among various federal, state, and provincial jurisdictions. Plains bison are managed as captive or free-ranging wildlife on National Wildlife Refuges and National Parks. They have dual status (domestic livestock or wildlife) in Alaska, Arizona, Idaho, Utah, Missouri, Montana, New Mexico, South Dakota, Texas, Wyoming, British Columbia, Saskatchewan, and Chihuahua, Mexico. Plains bison are classified solely as domestic livestock in Colorado, Illinois, Iowa, Kansas, Louisiana, Minnesota, Nebraska, North Dakota, Nevada, Oklahoma, Alberta, and Manitoba.

### **What management actions for plains bison have been taken by the private sector?**

The Nature Conservancy manages eight herds for conservation purposes, with initiatives for establishing two new herds. Turner Enterprises manages several herds with the dual purpose of conservation and commercial production. The American Prairie Foundation and the World Wildlife Fund have also developed conservation herds.

### **Are plains bison impacted by a loss of genetic diversity?**

In the late 1800s, plains bison experienced a severe population bottleneck – from tens of millions to possibly as few as 541 individuals, largely as a result of market hunting. However, pre-bottleneck numbers, movement, and distribution suggest widespread interbreeding and significant genetic homogeneity among continental populations. Additionally, the duration of the bottleneck was relatively short and the population quickly recovered. The selection of plains bison in early foundation herds also represented a large portion of the historical range. Today's plains bison have substantially greater genetic variation than reported for other mammals that have experienced similar bottlenecks. Selective movement of bison between herds, as currently practiced, can help maintain that genetic diversity. We do not believe that loss of genetic diversity is a limiting factor.

### **What caused introgression with cattle genes?**

Introgression was caused by hybridization between plains bison and cattle, followed by breeding of the hybrid offspring to plains bison. This resulted in cattle DNA replacing sections of the original plains bison DNA. When plains bison were at their lowest numbers in the late 1800s, a few individuals established small foundation herds that saved the plains bison from extinction. Each of these herds was to some extent used to either experimentally create bison-domestic cattle crosses, or supplemented with plains bison from herds involved in such experiments. Typically, male plains bison were bred to female domestic cattle, although the birth rate of first generation offspring was very low, and male offspring were usually sterile.

### **How has introgression with cattle genes impacted the plains bison?**

Due to the sterility of male offspring and the lack of domestic bulls that successfully bred with female bison, there is no evidence of male-linked or Y chromosome cattle gene introgression in bison. However, maternally-inherited (mitochondrial) DNA and nuclear DNA (contributed by either parent) introgression has been demonstrated, which indicates that many plains bison contain some cattle DNA from past experimental crosses. The presence of cattle DNA in the genetic makeup of plains bison appears widespread, but the proportion of cattle DNA that has been measured in introgressed individuals and herds is quite low, ranging from 0.56-1.8 percent. At this level of introgression, with continued proper management, we do not consider introgression to be problematic. In addition, bison from introgressed conservation herds conform morphologically, behaviorally, and ecologically to the scientific taxonomic description of the native plains bison. Therefore, we do not believe introgression with cattle genes is a limiting factor for plains bison.

### **Does climate change affect plains bison?**

We are not aware of any information on the direct relationship between climate change and plains bison. However, the species had a very extensive historical range that extended nearly coast to coast and from central Canada to northern Mexico. Therefore, it would appear that the plains bison is adaptable to a wide variety of climatic conditions. Consequently, we do not believe that climate change is a limiting factor.

### **Are there any distinct vertebrate population segments (DPS) of plains bison?**

The first element considered in the classification of a vertebrate species as a DPS is the discreteness of a population in relation to the remainder of the species to which it belongs. A population may be considered discrete if it is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors; or if it is delimited by international governmental boundaries within which differences in control of exploitation, habitat management, conservation status, or regulatory mechanisms exist that are significant. Plains bison populations are physically separated. However, nearly all plains bison descend from 76-84 individuals from five private foundation herds and no more than 30 wild bison in Yellowstone NP. The private foundation herds originated from across a large portion of the species' range. Later herds were established from foundation herds and subsequently augmented with plains bison from multiple herds in disparate locations. The diverse origins of early foundation herds and subsequent translocations that were undertaken (and continue to be undertaken) to establish new herds and augment existing herds have resulted in population segments that, despite physical separation, are essentially one metapopulation. Therefore the population segments are not markedly separate. In addition, each of the proposed population segments occurs within the U.S., so there are no international governmental boundaries to consider. Therefore, since the discreteness criteria was not met, we do not consider there to be any DPSs.

### **Why does this 90-day finding differ to some extent from an earlier 90-day finding published in 2007?**

A 2007 finding, which considered plains bison only in the Yellowstone National Park herd, concluded that the Yellowstone population might meet the criteria of discreteness for designation as a possible DPS. The 2007 finding also concluded that there was not substantial information indicating that listing under the ESA may be warranted. The 2007 finding concluded that the Yellowstone herd may be discrete from other plains bison because it was the only herd that had remained in a wild state since prehistoric times. However, additional information reviewed for the 2011 finding indicated that in 1902, when no more than 30 plains bison remained in Yellowstone NP, the Yellowstone herd was supplemented by 21 plains bison from captive herds in Montana and Texas. Additionally, intensive management (supplemental feeding, roundups, and selective culling) of the Yellowstone herd occurred from the 1920s through the late 1960s, which further compromised its wild status. Bison from Yellowstone NP have also been used to start or augment many later conservation herds. Consequently, we now know that the Yellowstone herd is only derived in part from wild stock and, despite its physical separation, is essentially part of one metapopulation. Therefore, we no longer believe that it meets the criteria for discreteness required to be considered a DPS.

### **How many species of bison are there?**

The genus *Bison* is represented by two extant species, the American bison (*Bison bison*) and the European bison (*Bison bonasus*). The American bison is further divided into two subspecies, the plains bison (*Bison bison bison*) and the wood bison (*B. b. athabascae*). The plains bison was the subject of this 90-day finding. The other subspecies, wood bison, is currently classified as endangered. A petition to reclassify the wood bison from endangered to threatened is currently under review. The range of the wood bison is north of the range of the plains bison, and extends from western Canada into Alaska.