

Bison

IN BRITISH COLUMBIA



Ecology, Conservation and Management



BRITISH
COLUMBIA

Ministry of Environment, Lands and Parks

Often referred to as buffalo, a term more properly confined to the African and Asian water buffalo, this is British Columbia's biggest land animal, and one of its rarest.



INTRODUCTION

The story of the North American Bison (*Bison bison*) is mysterious and tragic. Once, large herds supported the native people of the plains and nourished the first explorers and settlers. But by 1875, millions of Bison had diminished to a few hundred, mostly in captivity. Often wrongly called buffalo, the Bison is British Columbia's largest land animal, and one of the rarest. Although the total number of Bison in North America has increased and the species is not at risk today, there are few wild herds left, and we know almost nothing about the wild Bison that originally roamed the great plains.

TAXONOMY

Order

Artiodactyla
(Even-toed ungulates)

Family

Bovidae
(Bison, Mountain Goat, Bighorn and Thinhorn Sheep)

Genus

Bison

Species

bison

Subspecies

athabascae (Wood Bison)
bison (Plains Bison)

EVOLUTION AND APPEARANCE

Bison originated in Asia and spread into North America via the Bering land bridge at least 300,000 years ago, during the middle of the Pleistocene ice age. Bison have survived at least the last two major glaciations in North America. The primitive form, known as the Steppe Bison, gave rise to several species, at least one of which had much longer horns than today's Bison and was present on the Canadian prairies as recently as 9000 years ago. One lineage gave rise to the present-day species, which emerged about the time of the latest glaciation (15,000 to 20,000 years ago) and then evolved into two races or subspecies, the Wood Bison (*Bison bison athabascae*) and the Plains Bison (*Bison bison bison*).



David F. Fraser

The Bison is easy to recognize by its large size, massive forequarters, shoulder hump, large woolly bearded head, short black horns, and moderately long tail with a tassel of dark hair. Long, shaggy, chocolate-brown hair covers the head, shoulders, and front legs, but the coppery-brown coat on the hindquarters is short. The massive build and heavy coat of the Bison's forequarters make its slim hindquarters seem out of proportion. When bulls reach adult size at about six years, they stand 1.8 m at the shoulder and weigh about 550 to 900 kg. Adult females average about 320 to 545 kg. Bulls have thicker horns than cows, with tips that curve inward more. Bulls also have a more prominent hump and bushier hair on the forehead, chin, and neck. Wood Bison are slightly larger and darker than Plains Bison. They have relatively shorter hair on their neck mane and leg chaps and a more pronounced shoulder hump than Plains Bison.

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The Bison's unusual body shape is at least partly an adaptation to the need to forage through snow, which is a constant feature of their great plains and boreal forest environment in winter. They have spines on their upper vertebrae up to 50 cm long in adult bulls. These spines support large muscles that Bison use to swing their neck and head from side to side and clear snow away from their food. Although Bison feed almost entirely on grasses and sedges that easily get covered by snow, they can exist in areas where snow cover is too deep for most other hoofed mammals (ungulates).

DISTRIBUTION AND ABUNDANCE





When European explorers arrived in North America, the Bison's range extended from the Peace River region of British Columbia and the Great Slave Lake area in the Northwest Territories all the way down to northern Mexico. In Canada they ranged eastward to Manitoba and in the United States, almost to the Atlantic coast. The Rocky Mountains marked their approximate western limit. Wood Bison occupied the boreal forest region of northeast British Columbia, northern Alberta, northwest Saskatchewan, and southwest Mackenzie Territory. The Plains Bison occupied the other parts of the Bison range.

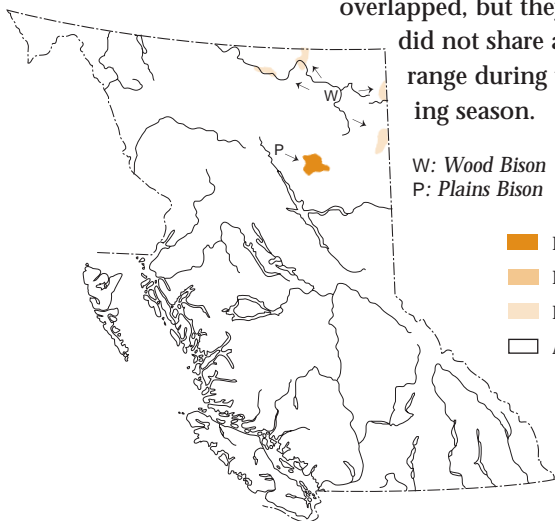
Bison once numbered about 30 million in North America, but when settlement moved westward in the United States and Canada, they were relentlessly slaughtered. By 1800, there were no more Bison east of the Mississippi, and by 1875, the prairie herds were reduced to isolated pockets. In 1893, there were only 20 free-ranging Bison left in Yellowstone National Park and about 300 in the Wood Buffalo National Park area of northern Alberta and southern Mackenzie Territory. Since that time, numbers have increased due to the protection of wild herds, the reintroduction of Bison into former habitats, and the establishment of fenced-in herds in parks and private ranches. The total North American Bison population now exceeds 75,000. Historically, Wood and Plains bison occupied different habitats and different geographic ranges. Along the southern edge of historic Wood Bison range (for example, the Peace River area of British Columbia) their winter ranges may have overlapped, but they probably



did not share a common range during the breeding season.

W: Wood Bison
P: Plains Bison

-  PLENTIFUL
-  MODERATE
-  FEW
-  ABSENT



There is no way of estimating the historic abundance of Wood Bison in British Columbia. The entire Canadian population probably numbered about 168,000 in the early 1800s. The population declined in the latter part of the 1800s and early 1900s, and the last confirmed naturally occurring Wood Bison was shot near Fort St. John in 1906. In the 1970s, about 50 imported Plains Bison escaped to the wild in the Pink Mountain area, and that population has grown to over 1000 head. Wood Bison have become established in northeast British Columbia as a result of reintroductions and reintroduced animals from Mackenzie Territory and Alberta moving into the province. In 1999, there were about 80 to 100 Wood Bison in three herds in British Columbia; an additional 100 Bison occupy the Hay-Zama area in British Columbia and Alberta.

LIFE HISTORY

Throughout much of the year, Bison form herds composed primarily of adult females, subadults of both sexes, and the year's new calves, but the size and composition of the groups change often. Mature bulls usually associate in smaller bachelor groups. Lone bulls are also relatively common.

Groups of cows and bulls mix during the rutting (breeding) period, which in northern areas may extend from July to September. At this time the dark, woolly display hair of the head and beard of adult bulls reaches its greatest development, and the bulls fight more often. Most of these interactions between bulls involve stylized threat displays and submission signals, but occasionally the fights end in injury or death. These events determine the bull's status, and the ones with the highest status do most of the breeding. Bulls also do more wallowing and tree-horning during the rut. The distinctive roar or bellow of rutting Bison may carry nearly 5 km. Bison are promiscuous, but they breed in one-to-one relationships called a tending bond.

Like other large-sized mammals, Bison have a lengthy gestation period of about nine months. A single reddish-tan calf, weighing 15 to 25 kg, is usually born between mid-April and early June. Bison calves are precocious and can stand within about 10 minutes of birth and nurse within 30 minutes. At first the cows have a close relationship

Bison were probably never abundant in British Columbia because of their limited distribution range in the northeast corner of the province.

Bison calves are very precocious, standing within about ten minutes of birth, and nursing within thirty minutes.

with their calves and often keep other Bison away from the newborns, but after two or three weeks, the calves cluster together in small groups. Although calves may nibble on grasses a few weeks after birth, they nurse for at least seven to eight months. The reddish birth-coat begins to darken to brownish black at about two months. Calves grow rapidly and weigh 135 to 180 kg by the time they are eight to nine months old.

A few well-nourished Bison cows may breed as yearlings, but Bison are not usually sexually mature until three to five years of age, and dominant Bison six years old or older do most of the breeding. In the wild, cows rarely produce a calf every year, and productivity rates for females two years and older are typically 50 to 60 percent.

Bison have been reported to live as long as 30 years in captivity, but in the wild very few survive more than 20 years. In northern areas, Wood Bison may starve in severe winters with deep snow or become more vulnerable to attacks by wolves. Large numbers of Bison can drown when a herd crosses a river on thin ice. Severe spring storms sometimes cause heavy calf losses. Diseases such as anthrax, brucellosis, and tuberculosis cause losses in Wood Bison in and around Wood Buffalo National Park. Anthrax causes outbreaks of mortality, usually in mature bulls, whereas brucellosis and tuberculosis are chronic diseases that reduce production, cause debilitation, and make the affected animals vulnerable to attack by predators. Animals in free-ranging herds in or near British Columbia are supposedly free of these infectious diseases. The size of a disease-free herd can grow rapidly if good quality forage is abundant. For example, 18 Wood Bison introduced

on the northwest side of Great Slave Lake in Mackenzie Territory increased to 300 head between 1963 and 1975.

Bison have an acute sense of smell, and this appears to be important in helping them to detect danger. Bison also

have excellent hearing and eyesight. They can distinguish large objects like a horse and rider at about 1 km, and moving objects at nearly 2 km.

ECOLOGICAL RELATIONSHIPS

Bison change location in response to seasonal changes in weather and food sources. In times past, wild herds of Plains Bison migrated long distances. In mountainous Yellowstone Park, Wyoming, resident Bison move between winter ranges in the valley bottoms and summer habitats at higher levels. In the boreal forest, these seasonal migrations are relatively short. They average about 16 km, but wandering mature bulls may travel 100 km or more. Tagging studies show that Wood Bison return to the same winter calving and breeding sites each year.

None of the hoofed mammals in British Columbia is more specialized for grazing than the Bison. In boreal areas, grasses and grasslike plants (graminoids) comprise over 85 percent of the Wood Bison diet in all seasons, and herbs that grow with the grasses make up much of the remaining 15 percent. Bison eat some shrubs, but primarily in summer, when about 8 percent of their diet consists of willow leaves.

In the north, where the snow can last for seven months and reach 1 m in depth, grazing animals need certain adaptations. The Wood Bison is eminently adapted to its niche as a boreal grazer. In northeast British Columbia, that niche is largely vacant. The Bison's chest height and the weight load on their feet make them poorly adapted to snow, but they can survive where few other ungulates can. The Bison's wintering adaptations include the unique head-swinging action it uses to clear away deep snow, its use of well-beaten trails between feeding areas, and its choice of productive meadows as winter grazing sites.

In the Slave River lowlands, Northwest Territories, wet meadows dominated by slough sedge and reedgrass (the Bison's main food) produce 4400 kg of dried forage per hectare. In summer, Wood Bison use willow savanna and large open prairies for calving and post-calving activities. They often use forest stands to travel between meadows, and they use wooded areas for shade in summer and shelter in winter storms. However, they do little foraging in the forest. They often choose sandy ridges for wallowing.

Of the species of hoofed mammals in British Columbia, none is more specialized for grazing than the Bison.



B. Elkin

Wolves are the main predators of northern Bison, but bears and wolves both may prey on Bison calves. Bison are the major food of wolf packs in Wood Buffalo National Park, Alberta, and in the Slave River lowlands and Mackenzie Bison Sanctuary, Northwest Territories. In one study, wolves were responsible for about 30 percent of Bison deaths, but wolves are usually not the only reason for declines in Bison populations.

VALUES AND USES

The Bison was by far the most important natural product in the economy of the plains Indians, who used virtually all parts of the animal for myriad purposes. First Nations people in boreal regions also hunted Wood Bison, and early explorers, fur traders, and settlers, particularly on the plains, depended heavily on Bison for survival.

Today, Bison herds are small and largely fenced-in, but they still have a variety of values. Bison ranching has become a profitable enterprise in the United States and Canada, including British Columbia. Confined herds in various national, state, and provincial parks and reserves also provide opportunities for public viewing and research. Ranchers buy surplus animals from captive herds and use them for restocking vacant ranges. Free-ranging herds, particularly those made up of pure Plains or Wood Bison stock, have an immense value for restocking Bison ranges and maintaining the wild genotype of Bison under natural selective pressures.

It is not easy to view Bison in British Columbia. However, with luck, it is possible to observe Plains Bison along the Alaska Highway in the vicinity of Pink Mountain. In Alberta, several national parks have confined herds on view in relatively natural surroundings. Limited entry sport hunting for Plains Bison is available near Pink Mountain in the upper Halfway and Sikanni Chief River watersheds. This program produces license revenue to support management programs, plus meat for successful hunters.

Re-establishment of viable Wood Bison populations in northeast British Columbia will generate values to society that go far beyond dollars and cents.

For many people, the value of Bison today lies primarily in their continued presence in the environment. This special reverence for the Bison stems largely from the mystique that surrounds them, their association with the American frontier,



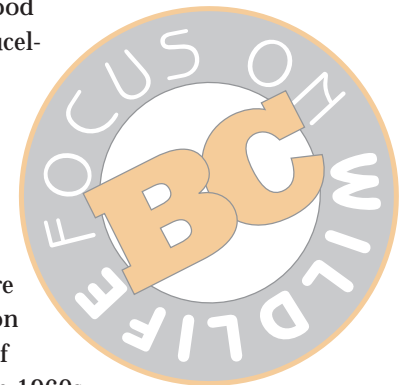
BULLS INCREASE THEIR WALLOWING ACTIVITY DURING THE BREEDING OR RUTTING PERIOD C. Gates

and the fascinating story they tell about conservation, or the lack of it, on this continent.

CONSERVATION

The ruthless slaughter of Plains Bison, their decline from many millions to a few hundred, and their eleventh-hour rescue and restoration form a saga of legendary proportions. Though Plains Bison now appear to be secure in numerous parks and reserves, agricultural cultivation and settlement make it virtually impossible to establish free-ranging herds on prairie grasslands today.

Uncontrolled hunting during the fur trade in the late 1800s severely depleted Wood Bison populations. North of the Athabasca River, these populations may have numbered 170,000 in primitive times, but by 1891 only 300 remained. Between 1893 and 1922, when Wood Buffalo National Park was formed to protect their habitat, numbers gradually increased to 1500 to 2000 head, thanks to protection against hunting. Between 1925 and 1928, the Canadian government transferred 6673 Plains Bison from overcrowded ranges at Wainwright, Alberta, into Wood Buffalo National Park. These Plains Bison hybridized with the smaller population of Wood Bison and introduced brucellosis and tuberculosis to them. As a result, people thought Wood Bison were extinct in the 1940s. However, in 1958 biologists discovered a remote population of pure or nearly pure Wood Bison in the northwest corner of Wood Buffalo Park. In the 1960s,



Wood Bison from that area were used to establish a new disease-free, captive herd at Elk Island National Park, Alberta, and a free-ranging herd on the northwest side of Great Slave Lake (now known as the Mackenzie Bison Sanctuary). The Elk Island herd was also infected with brucellosis and tuberculosis but is now free of these diseases. Both herds have increased and have been used to reintroduce Bison to historic habitats.

Wood Bison are listed in Appendix II of the Convention on Trade in Endangered Species of Wild Flora and Fauna (CITES). The international export of Wood Bison, including game farm stock, is regulated by CITES permits issued by the province under provisions of the provincial *Wildlife Act* and the federal *Wildlife Trade Act*. Since 1997, export for primarily commercial purposes has been permitted. In British Columbia, Wood Bison are on the Red List, which includes the rarest and most imperiled species or subspecies in the province. This designation applies to the small number of Wood Bison which have been released in northeast British Columbia or have spread there following releases in adjacent areas. Plains Bison are on the Blue List, which means they are considered vulnerable and are of special concern because of characteristics that make them particularly sensitive to human activities or natural events.

The goal of the Federal-Provincial Wood Bison Recovery Team is to establish at least four, free-ranging Wood Bison herds, each consisting of 400 or more Bison, within the Wood Bison's former distribution range. Unlike those of the Plains Bison, the northern habitats of Wood Bison are relatively intact. However, agricultural development and forestry in northeastern BC are potential impediments to re-establishing this subspecies and creating contiguous habitat. Releases of Wood Bison have resulted in new, disease-free wild herds in Mackenzie and Yukon territories, British Columbia, and Alberta. The Mackenzie Bison Sanctuary herd and the Yukon herds contain more than 400 animals. Threats to the recovery program include the spread of diseases from the Wood Buffalo National Park area, interbreeding with feral domestic Bison (resulting in loss of the genetic distinctiveness of Wood Bison), and habitat fragmentation.

Northeast British Columbia contains a significant area of former Wood Bison range. Re-establishing at least one herd of 400 or more pure Wood Bison in that part of the province would be a major success story in Canadian conservation. Returning this unique animal to its native haunts in BC will depend on public support for efforts to recover Bison habitat.



BISON ARE GRAZERS AND IN BOREAL AREAS, GRASSES AND GRASS-LIKE PLANTS COMPRISE OVER 85% OF THE WOOD BISON DIET FOR ALL SEASONS. P. Goetz

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