

## AMERICAN BISON AS WORLD HERITAGE



*Grizzly bear circling a Yellowstone bison bull. Kim Kaiser photo*

A copy of Buffalo Field Campaign's report and briefing to the World Heritage Committee on Yellowstone bison is online: <http://www.buffalofieldcampaign.org/worldheritage.html>

On January 31, 2008 and April 5, 2008 Buffalo Field Campaign provided a report and briefing respectively to members of the World Heritage Committee, World Heritage Centre and The World Conservation Union to provide these members resources to fairly conduct a scientific review on the conservation status of American bison and the distinct population of wild bison to inhabit its native range in the present environment of Yellowstone National Park and the contiguous public and private lands adjoined to this World Heritage site: <http://whc.unesco.org/en/list/28/documents/>  
<http://whc.unesco.org/en/decisions/1635>

The World Heritage Committee, World Heritage Centre and The World Conservation Union were asked to consider this presentation and critically apply its findings to the U.S. Department of Interior-National Park Service report on "the status of key conservation and management issues" for Yellowstone National Park and its examination by the Committee at its 32nd session July 2-10, 2008 in Quebec, Canada.

Buffalo Field Campaign appealed to the World Heritage Committee to consider that this last remnant population of wild bison to continuously occupy their native range in the United States is an indigenous wildlife species of "outstanding universal value" at risk or in danger of extinction, and under threat of genetic harm and loss of diversity.

The International Union for Conservation of Nature recognizes two subspecies of *Bison bison* and classifies the species conservation status as Near Threatened "in light of its dependence on an ongoing conservation programme, a very limited number of viable populations (five), and small populations." (Online: <http://www.iucnredlist.org/apps/redlist/details/2815/0>)

Yellowstone National Park was declared a Natural World Heritage Site in 1978 and listed as a World Heritage in Danger from 1995-2003. The United Nations Environment Programme and World Conservation Monitoring Centre have a report on Yellowstone

National Park, excerpted below, and online: <http://www.unep-wcmc.org/sites/wh/pdf/Yellowstone.pdf>



*Few wild bison remain protected as an indigenous wildlife species. The Yellowstone bison pictured here are the only population in the United States to have continuously occupied their native range. Kim Kaiser photo*

**KEY** ha=hectare km=kilometer m=meter mm=millimeter °C=Celsius

### **YELLOWSTONE NATIONAL PARK, WYOMING, UNITED STATES OF AMERICA**

Brief description: Yellowstone National Park, established in 1872, covers 9,000 square kilometres of a vast natural forest of the southern Rocky Mountains in the North American west. It boasts an impressive array of geothermal phenomena, with more than 3,000 geysers, lava formations, fumaroles, hot springs and waterfalls, lakes and canyons. It is equally known for its wildlife: grizzly bears, bison, wolves and wapiti, North American elk.

**Threats to the Site:** The Park was placed on the List of the World Heritage in Danger in 1995, because proposed adjacent mining for gold, silver and copper threatened the ecology and wildlife of the Yellowstone River. Ongoing contamination includes leaking sewage and waste, illegally introduced non-native lake trout which compete with the endemic Yellowstone cut-throat trout, road construction and year-round visitor pressures including the use of air-polluting snowmobiles in winter. Hundreds of bison were slaughtered in 1997 to eradicate brucellosis, a disease seen to endanger surrounding cattle. The authorities undertook to analyse thoroughly any measures taken to mitigate negative impacts.

The mine proposed in 1990 four kilometres from the northeast boundary would have stored toxic waste in the headwater area of major rivers. But in 1996 the President announced the removal of the threat through a US\$65 million land-trade, which included clearing up local mine contamination. Other progress reported to the World Heritage Committee were the repair of sewer lines, the removal of exotic trout in 2001 and the planned control of brucellosis by the Interim Bison Management Plan of the Greater Yellowstone Brucellosis Committee which included state and federal agencies and local cattle ranchers concerned with the potential spread of the disease. As a result of these measures the World Heritage Committee took the Park off the list of endangered sites in 2003.

**COUNTRY** United States of America - Wyoming

**NAME** Yellowstone National Park

**IUCN MANAGEMENT CATEGORY** II (National Park) Biosphere Reserve  
Natural World Heritage Site, inscribed in 1978. Natural Criteria i, ii, iii, iv Listed as World

Heritage in Danger in 1995 because of proposed adjacent mining, pollution of rivers, year-round visitor pressure and road construction. De-listed in 2003.

**BIOGEOGRAPHICAL PROVINCE** Rocky Mountains (1.19.12)

**GEOGRAPHICAL LOCATION** In the southern third of the northern Rocky Mountains, in northwestern Wyoming state, with small adjacent areas of Montana to the north and Idaho to the west. The eastern boundary is largely topographically defined; other boundaries are largely geometric: 44°08' - 45°07'N, 109°10' - 111°10'W.

**DATE AND HISTORY OF ESTABLISHMENT**

1872: Designated by the U.S. Congress, as the world's first National Park. Protection was provided by several congressional acts, initially under civilian then army administration;

1915: U.S. National Park Service (NPS) created and assumed management;

1976: The geothermal site was recognised as a Biosphere Reserve under the UNESCO MAB Program.

**AREA** 898,700ha: (Wyoming: 824,263ha, Montana: 61,144ha, Idaho: 12,743ha). The park is surrounded by the wilderness and wildlands of six national forests, two national wildlife refuges and Grand Teton National Park to the south. This Greater Yellowstone area is four times the size of the park itself and is considered the largest intact ecosystem in the temperate zone. Biosphere Reserve: 898,349ha.

**LAND TENURE** Federal government, except for 7.7ha. Administered by the National Park Service (NPS).

**ALTITUDE** Ranges from 1,610m to 3,462m. The plateau averages 2,500m.

**PHYSICAL FEATURES** The park lies in a caldera basin over a volcanic hot spot in the most seismically active region of the Rocky Mountains. Its central plateau is a 650,000ha forest surrounded by mountains that rise to 4,000m. Crustal uplifts 65 million years ago raised vast blocks of sedimentary rock to form the southern Rocky Mountains. For 25 million years andesitic volcanic ashflows and mudflows were common, covering and petrifying forests: nearly 200 species of petrified plants have been found. A more recent period of rhyolitic volcanism began in the region about two million years ago. During this time thousands of cubic kilometres of rhyolitic magma filled immense chambers under the plateau, then erupted to the surface. Three cycles of eruption, dated at 2.2 million, 1.2 million and 630,000 years ago, produced huge explosive outbursts of ash. The latest eruptive cycle formed a caldera 45km wide and 75km long when the active magma chambers erupted and collapsed, forming the Yellowstone plateau. The crystallising magma and injections of new magma are the source of heat for the hydrothermal geysers, hot springs, mud pots and fumaroles. Yellowstone contains more geysers than all the rest of the world with more than 300 in all, 200-250 being active, and more than 10,000 hydrothermal features.

Most of the area was glaciated during the Pleistocene, and many glacial features remain. The park lies on the headwaters of three major rivers: the Yellowstone River, a major tributary of the Missouri that flows via the Mississippi to the Gulf of Mexico, Firehole and Gibbon Rivers that unite to form the Madison River, which also joins the Missouri, and the Snake River that rises near the park's southern boundary and joins the Columbia to flow into the Pacific. Yellowstone Lake, 35,400ha in area, 2,357m high with a maximum known depth of 122m, is the largest high elevation lake in North America. Lower Yellowstone Falls, 94m high, is the highest of more than 40 named waterfalls in

the park.

**CLIMATE** Precipitation ranges from 258mm on the northern boundary to an estimated 2050mm in the south-west corner, falling mainly as snow. Temperatures range from a January mean of -12°C to a July mean of 13°C at Mammoth.

**VEGETATION** Approximately 80% of the park is forested, and 80% of that is dominated by lodgepole pine *Pinus contorta*. 15% is grassland. Great elevational differences produce a range of plant communities, from semi-arid steppe to alpine tundra. Eight species of coniferous trees and about 1,700 species of vascular plants grow in the park. Two, Ross's bentgrass *Agrostis rossiae* and Yellowstone sand verbena *Abronia ammophila*, are endemic (NPS, in litt., 2002). The thermal areas contain unique assemblages of thermal algae and bacteria. However the National Parks Conservation Association reports that there are also some 200 invasive species.

**FAUNA** The Park has about 58 species of mammals. There are seven species of ungulates native to the Park: elk *Cervus elaphus*, mule deer *Odocoileus hemionus*, bison *Bison bison*, moose *Alces alces shirasi*, bighorn sheep *Ovis canadensis*, pronghorn deer *Antilocapra americana*, a population recently halved in number' and white-tailed deer *Odocoileus virginianus*. One non-native, mountain goat *Oreamnos americanus* may be colonizing the park (NPS in litt., 2003). Among carnivores a nationally threatened species, grizzly bear *Ursus arctos* is present. There are over 105 breeding females in the greater Yellowstone area, and 205 cubs have been born in the last three years. There are an estimated 280-610 grizzly bears in the Greater Yellowstone area. Black bear *U. americanus* is also abundant. Some 25-30 mountain lions *Felis concolor* occupy the Northern Range of the Park, others enter the Park seasonally. Lynx *Lynx canadensis* are found and coyote *Canis latrans* are numerous. The coyote population in the Northern Range has declined 30-50% since wolves were introduced. The grey wolf (*Canis lupus* (EN) was native, was extirpated by the 1930s but was reintroduced in 1994-5, with the aim of 30 wolf packs reproducing in three recovery areas (Yellowstone, Idaho, northwest Montana) for three successive years before de-listing of the species. This has succeeded. There are now 145 free-ranging wolves in 14 packs (NPS in litt., 2002).

A palaeontological study of Lamar Cave yielded the remains of over 30 mammal species. This suggests a diversity of fauna in prehistoric times much like that found in Yellowstone today. Elk were found in six out of nine levels above and below a layer radiocarbon dated at 960 years BP. Grey wolf bones were found below the 960 BP layer, and a wolf carnassial tooth even lower.

290 bird species have been recorded, 148 breeding in the Park. Of special interest are the whooping crane *Grus americana* (EN), the nationally threatened bald eagle *Haliaeetus leucocephalus*, peregrine falcon *Falco peregrinus*, and trumpeter swan *Cygnus buccinator*. There are 13 native fish species. Yellowstone cut-throat trout *Oncorhynchus clarki bouvieri* and Arctic grayling *Thymallus arcticus* (V), are protected by regulations that also permit taking of non-native introduced species. Six exotic species of fish have been introduced, including brook trout *Salvelinus fontinalis*, lake trout *S. namycush*, brown trout *Salmo trutta*, rainbow trout *Oncorhynchus mykiss* and lakechub *Couecius plumbeus* (NPS pers.comm.1995). There are also 6 reptile and 4 amphibian species.

**CULTURAL HERITAGE** The Park's cultural history dates back 12,000 years. It includes prehistoric and historic use by a variety of American Indian groups who relied heavily on the resources of the area, exploration by trappers and adventurers and use by

contemporary American Indians, some resident up to the time of the Park's designation. About 2% of the park has been inventoried for archaeological resources, and some 575 prehistoric and historic archaeological sites have been recorded of which approximately 84% are American Indian (NPS pers. comm., 1995). Yellowstone has over 1,000 historic structures associated with the Euroamerican occupation and management of the park where the legacy of the early civilian and army administration and the history of concessions in national parks are preserved (NPS, pers. comm., 1995). Six of these structures are National Historic Landmarks: Fishing Bridge Trailside Museum, Madison Junction Trailside Museum, Norris Geyser Basin Trailside Museum, Northeast Entrance Station, Obsidian Cliff and Old Faithful Inn. There are four National Historic Districts: Lake Fish Hatchery, Mammoth Hot Springs, Old Faithful and Roosevelt Lodge. And there are five National Historic Sites: Lake Hotel, Lamar Buffalo Ranch, Obsidian Cliff Kiosk, Queen's Laundry Bath House and the U.S. Post Office at Mammoth Hot Springs. The Park's collections have some 200,000 natural and cultural objects including artwork, ethnographic and archaeological artifacts, historic objects, and natural resource specimens (NPS, pers. comm. 1995; NPS, in litt., 2002).

**CONSERVATION VALUE** Yellowstone provides a clear record of volcanic eruptions which have occurred over the past 55 million years and contains over 10,000 hydrothermal features, including fumaroles, mudpots, hot springs and over 300 geysers. The park is also a reservoir of genetic diversity and contains a natural forest ecosystem vast enough for the perpetuation of grizzly bear, wolf, bison and wapiti populations.

**CONSERVATION MANAGEMENT** Historically, Yellowstone has been managed both for the preservation of its resources in their natural condition and as the 'pleasuring ground' for tourists that it was also created to be. Wolves, mountain lions and coyotes were seen as threats both to the park's ungulates and to safe tourism, and from 1915 onwards were eradicated in an efficient predator control program. This led to overpopulation and disease amongst ungulates, necessitating large scale culls which caused controversy. Later, the desire to re-establish a more natural ecological balance has led to the reintroduction of some species formerly eliminated. Today there are three defined management zones: natural, 897,656ha; historic, 32ha; and development, 810ha. A master plan (1973), land protection plan (1986), an exotic vegetation management plan (1986) statement for management (1991), and a natural resources management plan (1995), are among the documents that guide conservation of park resources. A fire management plan was adopted in 1972, expanded in 1976 and revised in 1986. Following the major fire in 1988 it was revised again in 1990, 1992 and after the 1994 fire season again in 1995 (NPS, in litt., 2002).

Grizzly bears have been the subject of intensive study and management for more than 35 years. Their recovery has been of highest priority in the greater Yellowstone ecosystem since the species was listed as threatened in 1975, under the Endangered Species Act. This promoted an unprecedented level of interagency cooperation, and public controversy. Interagency Grizzly Bear Guidelines (1986) and a 1993 Grizzly Bear Recovery Plan are followed for their management. Cooperative interagency teams also direct the research into, monitoring and management of ungulates, mountain lions, coyotes, peregrine falcons, bald eagles and trumpeter swans with many other species and resources in the greater Yellowstone area. Hunting, logging, mining, and domestic livestock grazing are prohibited. Regulated fishing and camping are allowed.

**MANAGEMENT CONSTRAINTS** Although a very large area, Yellowstone is ecologically an island which is subject to the fragmentation of its habitats and is surrounded by livestock raising and mining claims which have made the protection of a buffer area of a Greater Yellowstone ecosystem controversial. This applies especially to its population of

bison which are the only wild continuously free-ranging bison in the United States, numbering about 3,500 in the winter of 1996-7 and have enormous national symbolic value. Winter weather naturally regulates their numbers in the Park, but snow-ploughing of park roads for snowmobiles facilitates their movement and their recolonising of lands outside the park. This has led to the perceived need for an annual cull north and west of the park during which thousands of bison have been killed by the US Department of Agriculture and the Montana Department of Livestock since 1985. This not only keeps their numbers in check, but is held to reduce the spread of brucellosis a disease which some of the Yellowstone bison population harbors and is said to cause brucellosis, causing cows them to abort their calves, and threatening the interstate shipment of cattle.

In 1995 the State of Montana sued the NPS and USDA Animal and Plant Health Inspection Service for delaying their long-term bison management planning and during winter of 1996-7 its agents shot and shipped to slaughter 1,500 bison in a brucellosis control campaign which became a nationally important public issue. After long negotiations, the federal agencies developed and in 2000, persuaded the State of Montana to adopt its final environmental impact statement on bison management designed to reconcile the free-ranging population with protection of Montana's livestock industry from the threat of disease. Measures include monitoring the population, permitting bison to range some of the public lands adjoining the Park in winter when there are no cattle present, and eventually vaccination (NPS, in litt., 2002).

The winter range of the northern Yellowstone elk herd has been under study since the 1920s. Past winter feeding by the management in the past increased numbers which then required control. To deal with overpopulation and overgrazing, elk were translocated to restock other ranges and numbers were reduced by ranger shootings until 1968. Since then, the National Park Service, U.S. Forest Service, and Montana Department of Fish, Wildlife and Parks have experimented with natural regulation, coupled with continuous monitoring, range studies, and hunting outside the park. Five of the seven elk herds are migratory which exposes them to conditions outside the Park's boundaries such as the carrying by some elk in both Wyoming and Idaho of brucellosis.

The isolated pronghorn population may also be threatened by commercial development and subdivision of private lands north of the park. Rainbow and brown trout have replaced cut-throat trout and grayling in much of the Madison River. Predatory lake and brown trout have severely affected the Snake River fine-spotted cut-throat. Lake trout were apparently illegally stocked in Yellowstone Lake some time before 1994 and threaten the native cutthroat trout and piscivorous species and ecosystem that depend on them - grizzly bears, bald eagles and several other species of mammals and birds. Some progress has been made by an intensive campaign since 1995 to eradicate lake trout - 43,000 were removed in 2001 (UNESCO, 2002), but it will need constant work. Another threat is invasion by the whitebark pine blister rust which destroys a source of grizzly bear fodder.

Among other threats, 248 fire starts were recorded in the greater Yellowstone area in 1988. A let-burn policy towards naturally started fires allowed 31 to burn as prescribed fires, covering 157,480ha. Of five large fires originating outside the park, three, including the largest of all (the North Fork Fire, 201,610ha) were man-made. They were fought from the start, but still destroyed 36% (321,520ha) of the area within the Park. Surface mining, oil, gas and geothermal exploration and extraction near park boundaries, leakage from sewer lines, contamination by wastes, by road construction and maintenance and the year-round pressure of visitors all potentially threaten the park's air and water quality, visual integrity and critical habitat for wildlife. One example is the

intrusion, sanctioned by the federal government in mid-2002, of individual snowmobiles which may total 75,000 and introduce fumes and noise into the winter wilderness. This was done in the face of a previous Park Service ban, the findings of a major study, wide public opposition to snowmobile use and the Park authority's advocacy of less polluting snow-coaches (NPCA, 2002).

A major challenge was the proposed New World mine 4.2km from the northeast corner of the park in the headwaters of three streams. Toxic waste from this would have threatened the Park's streams and affected grizzly bears, bald eagles, bighorn sheep, elk, fish and many smaller animals (Anon., 1995; National Parks, July 1995, 1997). Such plans to exploit its resources led to Yellowstone being placed on the list of World Heritage in Danger in 1995 (UNESCO, 1996), an action questioned by defenders of national sovereignty over property rights in the U.S. (Rabkin, 1997). In 1998 the government compensated the company with \$65 million for divesting its interest in the gold mine site (UNESCO, 1999). A moratorium has also since been placed on mining around Yellowstone to prevent the expansion of existing mines. However, pollution from abandoned tailings will have to be warded off in permanently. A proposed nuclear waste incinerator in Idaho, is also seen by conservationists as a potential threat to its air quality (NPS, 2001).