

## WORLD HERITAGE NOMINATION

### IUCN TECHNICAL REVIEW

1. IDENTIFICATION NUMBER AND NAME 256 WOOD BUFFALO NATIONAL PARK
2. LOCATION: Situated in the North West territories and Alberta, Canada
3. NOMINATED BY: Government of Canada
4. DOCUMENTATION:
  - (i) Nomination form and map and annexes
  - (ii) Supplementary documentation (IUCN)
    - a) Consultations: Harold Eidsvik; James Thorsell; M. Cobus.
    - b) see attachments

### 5. BACKGROUND AND SUMMARY

Wood Buffalo is the most important protected area within the Canadian Taiga biogeographical province, containing the only breeding ground of the whooping crane and a large population of both subspecies of North American bison, of which the Wood bison is by far the more important. The area contains a wide variety of geographical formations, with a hydrological system that is probably unique in the world; the assemblage, variety and concentration of recharge and discharge features is unsurpassed. The vegetation includes the largest unaltered grasslands left on the North American continent; the relatively simple vegetation supports an important assemblage of wildlife species, many occurring in very large populations; these include all four species of Lune gavia, all seven species of North American grebe and 25 species of duck. The complete ecosystems allow the natural interaction between major and simple predator-prey relationships, such as moose-wolf-bison. (See attached data sheet for additional details).

### 6. INTEGRITY

At nearly 4.5 million ha, this is the largest national park in North America and one of the largest in the world, providing ample room for most ecological processes to continue undisturbed. The area has a management plan, which has been called "the best one that Parks Canada has done", helping to guide the management activities carried out by the highly professional Parks Canada. A number of complete ecosystems are included within the site, though among the most important ones -- for example, the whooping crane habitat -- it is impossible to include the entire annual range of the species as it is highly migratory and spends part of the year in the United States. A dam on the Slave River has been discussed and may have an impact on certain portions of the site; however, there is considerable doubt about the financial viability of this project and it is highly unlikely to go forward for some time. Further, when it is more seriously considered, the Canadian Government will prepare the necessary environmental impact assessments before going ahead with the project.

### 7. COMPARISON WITH OTHER AREAS

Only Prince Albert and Riding Mountain National Parks compare to Wood Buffalo ecologically, but these are much smaller, contain fewer endangered species,

lack many of the geological attractions, and are no way comparable. The nearby World Heritage Site of Nahanni and the Wrangel-St. Elias World Heritage Site shared between the US and Canada are in a separate biogeographical province, so are not truly comparable; rather they are complementary.

#### 8. EVALUATION

Wood Buffalo is the most ecologically complete example of the entire great plains ecosystem of North America, the only place where the predator-prey relationship between wolves and bison has continued to exist (criteria ii). The great concentrations of migratory wildlife are of world importance, and the karst formations equally are internationally significant (criteria iii). The ecosystems also support populations of native Americans who still continue some of their traditional ways of life, thus adding the human element to the completeness of the ecosystem. Wood Buffalo contains the only breeding habitat in the world for the whooping crane, primarily because of the careful management of the small number of breeding pairs protected in the park (criteria iv). The area is well managed and under no particular threat; it is sufficiently large to ensure that the natural ecological processes of the area continue.

#### 9. RECOMMENDATION

Wood Buffalo meets criteria (ii), (iii), and (iv), so it should be inscribed on the World Heritage List. The Committee might wish to express its interest in being kept informed over the possible construction of a dam on the Slave River which might have impact on the site.

International Union for Conservation of  
Nature and Natural Resources

15 April 1983

NAME Wood Buffalo National Park

MANAGEMENT CATEGORY II (National Park)

Proposed World Heritage Site (Criteria: ii, iii, iv)

BIOGEOGRAPHICAL PROVINCE 1.4.3 (Canadian Taiga)

LEGAL PROTECTION Total, though certain traditional native hunting, fishing and trapping is permitted

DATE ESTABLISHED 1922 (as 2,600,000ha), expanded in 1926

GEOGRAPHICAL LOCATION On the boundary between Alberta and Northwest Territories. 58°00'05"-60°40'03"N, 111°00'02"-115°30'05"W

ALTITUDE 217-945m

AREA 4,480,000ha

LAND TENURE Government of Canada

PHYSICAL FEATURES A vast wilderness area of the Northern Plains with 4 main topographic features: erosion plateaux left by glaciers; glaciated plains; a delta formed by two major rivers; and alluvial river lowlands. The lowlands and floodplains of the Peace, Athabasca and Slave Rivers and the delta in Lake Athabasca exhibit classic fluvial landforms, with a complex series of meander scars, oxbow lakes and former river terraces, and good examples of birds-foot delta development. Saline plains with evaporites and extensive karstic topography are also represented on the Slave River lowland, and the mudflats of one plain are dramatically dominated by mineral salt in dry periods, these salt plains being unique in Canada. The Slave Plain is well-drained through porous bedrock, and exhibits sinkholes, sunken valleys, caves, submerged rivers, classic small anticlines and a complex recharge-discharge hydrology featuring swallow holes and cold springs, some with mineralized water. Buffalo-Lake Robertson Plain is underlain by impervious shale and discontinuous permafrost, resulting in vast areas of muskeg with shallow lakes and meandering creeks. The uplands of Birch and Caribou plateaux have been eroded by rivers to form long, incised gorges with long stratigraphic cross-sections of bedrock and large alluvial fans. Geologically the area has a thin Palaeozoic sequence of Middle and Upper Devonian rocks with the east boundary of the Park almost coincident with the Precambrian Canadian Shield/Palaeozoic contact along the Athabasca and Slave rivers. The plateaux are of Lower and Upper Cretaceous age. Gypsum and anhydrite are abundant and minor amounts of salt, potash and limestone occur. Glacial deposits cover much of the area. The climate is boreal continental with long cold winters and short warm summers, temperatures ranging from daily means of -25°C (January) to 16°C (July). Annual precipitation is about 310mm, but annual evaporation is 410mm. This moisture deficit coupled with an average 40 thunderstorms per season puts the Park in an extreme forest-fire weather zone. The brief frost-free period extends from early June to early September but much of the Park is permanently underlain by discontinuous permafrost. Winter daylight period is short, while mid-summer daylight period is over 20 hours.

VEGETATION Detailed knowledge of the vegetation exists for less than 5% of the area, but there is a relatively limited flora due to the high latitude and unvarying topography. Vegetation is typical of the boreal forest zone with predominantly white spruce Picea glauca, black spruce P. [mariana], jack pine Pinus banksiana and tamarack Larix laricina. Many watercourses have stands of balsam poplar Populus balsamifera and some uplands have nearly pure stands of aspen P. [tremuloides]. Extensive stands of white spruce forests cover the banks of the Peace, Athabasca and Birch rivers. Lodgepole pine Pinus contorta var latifolia occurs along the slopes of the cretaceous plateau on the western edge of the park. The upper surface of the plateau is about 1,500m above the rest of the Park and supports a spruce-willow-birch upland tundra community. Some areas of prairie with grasses occur, dominant species being Calamagrostis canadensis, Deschampsia caespitosa, Poa and Carex and the Peace-Athabasca delta has flats with marshes of cat-tail Typha latifolia and sedges Carex rostrata, C. [atheroides] and C. [aquatilis]. Shrublands of willow Salix spp. and alder Alnus sp. occur where the wet soils of the marshes meet the drier soils of the forests. There is also extensive muskeg in the west and north of the Park, an association of black spruce, sphagnum moss and northern heath plants. The Park contains the largest undisturbed grass and sedge meadows in North America. About 1% of the Park burns each year, about average for boreal forests in this part of Canada.

#### NOTEWORTHY FAUNA

The park was created specifically to protect North American bison, the largest free-roaming, self-regulating herd in existence, (5-6,000) and consisting of hybrids between wood bison Bison bison athabascae and plains bison Bison bison bison. This area is the only place where the predator-prey relationship between wolves and bison still exists. A total of 46 mammals have been recorded including black bear Ursus americanus, woodland caribou Rangifer tarandus caribou, moose Alces alces, wolf Canis lupus (V), lynx Lynx canadensis, snowshoe hare Lepus americanus, muskrat Ondatra zibethica, beaver Castor canadensis and mink Mustela vison. Occasionally animals more common to southern Canada are seen, such as arctic fox Alopex lagopus, porcupine Erithizon dorsatum and white tailed deer Odocoileus virginianus. 227 bird species have been recorded (including species characteristic of all boreal forest habitats) which include great grey and snowy owls Strix nebulosa and Nyctea scandiaca, willow ptarmigan Lagopus lagopus, redpolls Acanthis, crossbills Lorix and boreal chickadee Parus hudsonicus. It is the only breeding site of the whooping crane Grus americanus (E) with 73 out of a total of 110 birds spending the summer in the park, Peregrine falcon Falco peregrinus (V) (the only remaining population in central Canada) and bald eagles Haliaeetus leucocephalus also breed within the Park. The Peace-Athabasca Delta is an important area for migrant waterfowl including Snow, white-fronted and Canada geese Anser caerulescens, A. [albifrons], and Branta canadensis, whistling swans Cygnus columbianus, all 4 species of loon Gavia, all 7 species of North American grebe (Podicipedidae) and 25 species of duck (Anatidae). In 1940 there were only 21 whooping cranes in existence, but due to protection and intensive management of the flock here (and protection of their wintering ground in Texas) their extinction has been averted. The caves of the karstlands provide essential hibernation sites for bats. Reptiles and amphibians are severely limited in numbers, but the Canadian toad, leopard frog and red-sided garter snake reach their northern limits here. Also found are the boreal chorus frog and the wood frog. The fish are not well known, though there is a wide variety of aquatic habitats. 36 species have been recorded to date, 4 of them introduced. Preliminary information suggests that pearl dace, fathead minnow and Iowa darter may be at their northern limit. The inconnu (circumpolar species) spawns in Buffalo Lake and the delta is an important spawning area for goldeye and walleye. Sticklebacks found in the karst lakes lack pelvic girdles.

#### CULTURAL HERITAGE

A series of different hunter-gatherer cultures occupied the area continuously from about 7,000 years ago up to the present. In the 18th century there were Beaver, Slave and Sarsi natives. Cree and Chipewyan gained ascendancy and integrated with European settlement.

#### ZONING

Class I: Whooping Crane Nesting Habitat: Athabasca Delta. Public access to this area is restricted during the breeding season. The majority of the park is Class II or III. Exploitation-free zones may be established in the future.

#### CONSERVATION MANAGEMENT

An environment impact assessment will be done regarding the proposed dam on the River Salve. The National Park Policy provides comprehensive operational guidelines for the management of the Park. In addition, Parks Canada has produced a comprehensive management plan which includes provisions for fire control. Environmental safeguards have been put into effect within the timber berth. Wolf control is practiced outside the park. Sixteen cottage leases in the park will only be extended beyond their legal termination date under some temporary tenure arrangement which will eventually return to the Park. Public education programmes are run by the staff. Hunting and trapping by the indigenous inhabitants for game, other than buffalo, is allowed under licence but is subject to regulations. Boundary changes are being considered which should strengthen the Park by including adjacent valuable land or removing small problematic areas.

#### DISTURBANCES OR DEFICIENCIES

From 1922 until 1964 the park was not administered by the National Parks, and the objectives were to help create a stable regional economy and provide economic benefit to the local residents. This resulted in intensive management of the bison and commercial activities being allowed. The plains bison brought brucellosis and tuberculosis into the park and some control measures may be necessary in the future. Outbreaks of anthrax are already subject to control. Logging is permitted over 56,000ha and operations will continue until the lease runs out in 2002. The Athabasca Delta is subject to water level fluctuations due to existing dams upstream and future dams could cause greater perturbations. A hydro-electric project proposed for the Slave River adjacent to the park would affect some park lands, but Parks Canada hopes to ensure that the Peace-Athabasca Delta is unaffected. Land may be withdrawn from the park as a result of native land claim settlements, but it is anticipated that this will not change the significance of the Park greatly. Sport fishing is permitted.

#### TOURISM

1,798 visitors in 1981/82. Supplies services and accommodation are available in the towns of Hay River and Fort Smith outside the Park. There are 36 campsites and 50 group tenting.

#### SCIENTIFIC RESEARCH

Studies of fire ecology, karst topography, waterfowl, whooping cranes, wetlands ecology in relation to proposed damming (in the Athabasca Delta), and the biology and control of disease in bison.

#### SPECIAL SCIENTIFIC FACILITIES

None

#### PRINCIPAL REFERENCE MATERIAL

A review of the available literature was carried out by Scace and Associates (1974, Wood Buffalo National Park - a literature review), but more recently literature on the National Parks of Canada has been listed and indexed by the National Parks Documentation Centre.

Airphoto Analysis Associates (1979). Integrated Resources Survey, Wood Buffalo National Park.

STAFF 28 full-time employees including a resident director; seasonal staff. 40.49 person-years in 1982/83.

BUDGET Total expenditure US\$2,318,000 in 1982/83.

LOCAL PARK OR RESERVE ADMINISTRATION Mr Bob Readhead, Superintendent, Wood Buffalo National Park, Box 750, Fort Smith, Northwest Territories, Canada X0E, OPO or Praire Regional Office, Winnipeg, Manitoba.

DATE April 1983

>CANADA-Wood Buffalo National Park

CANADA - Alberta

NAME Wood Buffalo National Park

MANAGEMENT CATEGORY II (National Park)  
X World Heritage Site (Criteria: ii, iii, iv)

BIOGEOGRAPHICAL PROVINCE 1.04.03 (Canadian Taiga)

GEOGRAPHICAL LOCATION On the boundary between Alberta and North-west territories. 58°00'-60°40'N, 111°00'-115°30'W

DATE AND HISTORY OF ESTABLISHMENT 1922 (as 2,600,000ha), expanded in 1926. Includes much of the Whooping Crane Summer Range and the Peace-Athabaska Delta (Wood Buffalo National Park section), both designated as Ramsar sites in May 1982.

AREA 4,480,000ha

LAND TENURE Government of Canada

ALTITUDE 217-945m

PHYSICAL FEATURES A vast wilderness area of the Northern Plains with four main topographic features: erosion plateaux left by glaciers; glaciated plains; a major freshwater delta formed by two major rivers; and alluvial river lowlands. The lowlands and floodplains of Peace, Athabasca and Slave rivers and the delta in Lake Athabasca exhibit classic fluvial land forms, with a complex series of meander scars, oxbow lakes and former river terraces, and good examples of birds-foot delta development. Saline plains with evaporites and extensive karstic topography are also represented on Slave River lowland, and the mudflats of one plain are dramatically dominated by mineral salt in dry periods, these salt plains being unique in Canada. Slave River Plain is well-drained through porous bedrock, and exhibits sinkholes, sunken valleys, caves, submerged rivers, classic small anticlines and a complex recharge-discharge hydrology featuring swallow holes and cold springs, some with mineralised water. Buffalo-Lake Robertson Plain is underlain by impervious shale and discontinuous permafrost, resulting in vast areas of muskeg with shallow lakes and meandering creeks. The uplands of Birch and Caribou plateaux have been eroded by rivers to form long, incised gorges with long stratigraphic cross-sections of bedrock and large alluvial fans. Geologically the area has a thin Palaeozoic sequence of Middle and Upper Devonian rocks, with the east boundary of the park almost coincident with the Precambrian Canadian Shield/Palaeozoic contact along Athabasca and Slave rivers. The plateaux are of Lower and Upper Cretaceous age. Gypsum and anhydrite are abundant and minor amounts of salt, potash and limestone occur. Glacial deposits cover much of the area.

CLIMATE The climate is boreal continental with long cold winters and short

Infobase produced by WCMC, January 1992

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**FAUNA** The park was created specifically to protect North American bison, the largest free-roaming, self-regulating herd in existence (5-6,000), and consisting of hybrids between wood bison Bison bison athabascae and plains bison Bison bison bison. The herd numbered 10,000 in early 1970s, but has since declined to less than 4,500 (1987). This is the only site where the predator-prey relationship between wolves and bison still exists. A total of 46 mammals has been recorded including black bear Ursus americanus, woodland caribou Rangifer tarandus caribou, moose Alces alces, wolf Canis lupus (V), lynx Lynx canadensis, snowshoe hare Lepus americanus, muskrat Ondatra zibethica, beaver Castor canadensis and mink Mustela vison. Occasionally animals more common to southern Canada are seen, such as arctic fox Alopex lagopus, porcupine Erithizon dorsatum and white-tailed deer Odocoileus virginianus. A total of 227 bird species has been recorded (including species characteristic of all boreal forest habitats) which include great grey and snowy owls Strix nebulosa and Nyctea scandiaca, willow ptarmigan Lagopus lagopus, redpolls Acanthis, crossbills Lorix and boreal chickadee Parus hudsonicus. It is the only breeding site of whooping crane Grus americanus (E) with 73 out of a total of 110 birds spending the summer in the park. Peregrine falcon Falco peregrinus (V) (the only remaining population in central Canada) and bald eagles Haliaeetus leucocephalus also breed within the park. The Peace-Athabasca Delta is an important area for migrant waterfowl including snow, white-fronted and Canada geese Anser caerulescens, A. albifrons and Branta



canadensis, whistling swan Cygnus columbianus, all four species of loon Gavia, all seven species of North American grebe (Podicipedidae) and 25 species of duck (Anatidae). In 1940 there were only 21 whooping cranes in existence, but due to protection and intensive management of the flock in the park (and protection of their wintering ground in Texas), their extinction has been averted. The summer nesting habitat has been designated under the Ramsar Convention as a wetland of international importance. The caves of karstlands provide essential hibernation sites for bats. Reptiles and amphibians are severely limited in numbers, but Canadian toad, leopard frog and red-sided garter snake reach their northern limits here. Also found are boreal chorus frog and wood frog. The fish are not well known, although there is a wide variety of aquatic habitats. Thirty-six species have been recorded to date, four of them introduced. Preliminary information suggests that pearl dace, fathead minnow and Iowa darter may be at their northern limit. The inconnu (circumpolar species) spawns in Buffalo Lake, and the Peace-Athabasca delta is an important spawning area for goldeye and walleye. Sticklebacks found in the karst lakes lack pelvic girdles, a unique adaptation to this environment.

CULTURAL HERITAGE A series of different hunter-gatherer cultures occupied the area continuously from about 7,000 years ago up to the present. In the 18th century there were Beaver, Slave and Sarsi natives. Cree and Chipewyan gained ascendancy and integrated with European settlement.

LOCAL HUMAN POPULATION The community of Garden River (population 150) is located within the park. Approximately 6,600 residents live in the three small communities of Fort Smith, Hay River and Fort Chipewyan, adjacent to the park. Some local residents harvest game in the park subject to regulations. A maximum of 370 permits is issued for hunting and trapping. Some of these individuals who hold trapping permits may reside in the park during the winter months.

VISITORS AND VISITOR FACILITIES 5,700 visitors in 1988. Supplies, services and accommodation are available in the towns of Hay River and Fort Smith outside the park. There are 36 campsites and 50 group tenting within the park at Pine Lake.

SCIENTIFIC RESEARCH AND FACILITIES Studies of fire ecology, karst topography, waterfowl, whooping cranes, wetlands ecology in relation to proposed damming (in the Athabasca Delta), and the biology and control of disease in bison.

CONSERVATION MANAGEMENT National park policy provides comprehensive operational guidelines for the management of the park. A park management plan has been prepared as an expression of this policy, and provides guidance for park management, operations and development. A zoning plan included as part of the management plan designates the bulk of the park as wilderness (Zone II) or special preservation (Zone I). Special preservation areas include the whooping crane nesting habitat, a bison grazing and calving area in the Peace-Athabasca Delta, examples of karst features and significant archaeological sites. A natural resource management programme consisting of resource inventories, studies and

preparation of resource management plans is being implemented. All proposed developments and management actions are subject to the environmental assessment and review process. Hunting and trapping by local residents for game, other than buffalo, is allowed under permit, but is subject to Park regulations. A commercial timber berth, operating under long-term lease is subject to environmental controls.

MANAGEMENT PROBLEMS From 1922 until 1964 the park was not administered by the National Parks Branch, and management of the area was not oriented toward conservation but intended to help create a stable regional economy and provide economic benefit to local residents. This resulted in intensive management of bison and other species. Commercial activities such as lumbering were allowed. Plains bison moved to the park in 1925, interbred with native wood bison resulting in the hybridisation of the two subspecies and the introduction of bovine tuberculosis and brucellosis. Management measures were undertaken in the 1960s and 70s to control diseases and may be necessary in the future. Disease and changes in habitat appear to be a major factor causing the decline of the herd. The Peace-Athabasca Delta is drying out causing important food sources to disappear and allowing easier access to predators. The changes are largely due to the downstream effects of the Bennett Dam constructed in 1969. Water quality in the Peace River is now being threatened by the construction of pulp mills upstream of the park which have the potential to pollute park waters and cause ecological changes. The issue of diseased bison is currently being examined by a Federal Environmental Assessment Review Panel. Changing water levels in the Peace-Athabasca delta areas have altered an internationally important waterfowl nesting area, recognised under the Ramsar Convention. The park is subject to land claims by native people. One claim affecting the Peace-Athabasca Delta area was settled in 1985, another claim affecting the area north of the 60° parallel of latitude is pending. Effects of the land claim settlement have included boundary adjustments, entrenchment of resource harvesting rights and creation of advisory boards composed of local natives. Land claims currently being negotiated will have similar implications for park management. Commercial logging is permitted over 56,000ha and will continue until the lease expires in 2002. Sport fishing is allowed, under permit.

TAFF 31 full-time employees including a resident superintendent; 46.67 person-years of employment (1989/90).

BUDGET Total expenditure Can.\$849,400 (Operations and Maintenance), \$772,000 Capital Development (1989/90 fiscal year)

LOCAL ADMINISTRATION Mr Ken East, Superintendent, Wood Buffalo National Park, Box 750, Fort Smith, Northwest Territories, Canada X0E, OPO or Director General, Canadian Parks Service, Prairie & Northern Regional Office, 457 Main Street, Winnipeg, Manitoba, Canada R3B 3E8

#### REFERENCE

A review of the available literature was carried out by Scace and

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Associates

(1974, Wood Buffalo National Park - a literature review), but more recently, literature on the National Parks of Canada has been listed and indexed by the National Parks Documentation Centre, Ottawa, Ontario.

Airphoto Analysis Associates (1979). Integrated Resources Survey, Wood Buffalo National Park.

CNPPA Summary Status Report (1984). Threatened Protected Areas of the World (draft).

Parks Canada (1984). Wood Buffalo National Park Management Plan.

Parks Canada (1988). Park Conservation Plan

DATE April 1983, updated May 1989, September 1989, November 1989  
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