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NAHANNI NATIONAL PARK CANADA

The Park is in the mountain wilderness of Canada's Northwest Territories along the South Nahanni River near the Yukon border. It shows a unique combination of ongoing geological processes with one of the most spectacular wild river canyons, wilderness waterfalls and limestone landscapes in North America. It contains a striking sub-arctic karst cave system, is home to boreal forest animals such as wolves, grizzly bears and caribou and on its alpine levels, Dall's sheep and mountain goats.

Threats to the Site: Development of an existing ore mine and 165 km access road are likely to contaminate the river, groundwater and unique karst landscape.

COUNTRY

Canada

NAME

Nahanni National Park

NATURAL WORLD HERITAGE SITE

1978: Inscribed on the World Heritage list under criteria vii and viii.
One of the first four natural World Heritage sites to be established.

STATEMENT OF OUTSTANDING UNIVERSAL VALUE [pending]

The UNESCO World Heritage Committee issued the following statement at the time of inscription:

Statement of Significance

Nahanni National Park is a 4,700 sq. km. undisturbed natural area of deep river canyons cutting through mountain ranges, with huge waterfalls and complex cave systems. The geomorphology of the park is outstanding in its wealth of form and complexity of evolution. Fluvial processes and features predominate. Within the park are examples of almost every distinct category of river or stream that is known along with one of North America's huge waterfalls, Virginia Falls. The Flat and South Nahanni rivers are older than the mountains they dissect and have produced the finest examples of river canyons in the world, north of 60°. The injection of igneous rock through tectonic activity has resulted in spectacular granitic peaks.

Criterion (vii): The Nahanni River is one of the most spectacular wild rivers in North America, with deep canyons, huge waterfalls, and spectacular karst terrain, cave systems and hot springs. Exposure of geologic and geomorphologic features includes the meanders of ancient rivers, now raised high above present river levels.

Criterion (viii): In Nahanni National Park, there is exceptional representation of on-going geological processes, notably fluvial erosion, tectonic uplift, folding and canyon development, wind erosion, karst and pseudo-karst landforms, and a variety of hot springs. The major geologic and geomorphologic features provide a combination of geological processes that are globally unique.

IUCN MANAGEMENT CATEGORY

II National Park

BIOGEOGRAPHICAL PROVINCE

Canadian Taiga (1.04.03)

GEOGRAPHICAL LOCATION

In the south-west corner of the Northwest Territories, in roadless wilderness 130 km southwest of Fort Simpson, on the South Nahanni and Flat Rivers. Access is by the Liard Highway, 64 kilometres to the east and via airstrips at Rabbitkettle Lake and Virginia Falls. Nahanni Butte is the nearest village, 20 km from the Park's eastern boundary. Its coordinates are 61° 05' to 62° 01'N, 123° 36' to 127° 30'W.

DATES AND HISTORY OF ESTABLISHMENT

1972: Established as a National Park Reserve for its wilderness value following settlement of aboriginal claims; One of the first four natural World Heritage sites.

1987: The section of the South Nahanni River in the Reserve was designated a Canadian Heritage River by the Canadian Heritage Rivers Board; 1994: Reserve site extended.

LAND TENURE

Government of Canada. administered by Parks Canada.

AREA

476,560 ha.

ALTITUDE

From 180m to 2,640m (Ragged Range).

PHYSICAL FEATURES

The Park lies in the northern section of the taiga cordilleran physiographic region; a diverse area of mountain ranges, rolling hills, high plateaus, broad depressions and incised valleys. It contains a unique combination of ongoing geological processes: fluvial and wind erosion, tectonic uplift, folding, canyon development, mass wastage, karst and pseudo-karst formations, hot springs and signs of past glacial activity. The western end is formed by the Selwyn range of the Mackenzie Mountains and the sawtoothed igneous Ragged Range, which both carry glaciers. The southern boundary edges the boreal cordillera; the eastern end reaches into the taiga plains. In a valley below the Ragged Range, a tufa mound 60m wide called Rabbitkettle, rises 30m in a succession of intricate terraces around a hot spring. Contrasting sharply with these, in the centre and east of the Park, are sections of the deeply dissected sandstone, mudstone, shale and limestone hills of the Funeral and Headless Ranges and Tlogotsho and Liard Plateaus, and the Mackenzie plain.

Large areas of the centre of the Park have remained unglaciated for up to 300,000 years. Near the eastern end, in an area of sands, are 6m high wind-eroded forms of white sandstone, the Sand Blowouts, and the Yohin lake (Ford, 1984; Parks Canada, 2001). According to the leading geologist consulted on the creation of the World Heritage site, the limestone landscape within the watershed to the north of the Reserve is the most important subarctic karst known, with the most striking dissolutional karst landscape in the northern hemisphere (Ford, 2005). The Grotte Valerie cave system (closed to visitors) is one of the finest ice-caves in the world. It contains grand chambers and tunnels 1,900m long and the Gallery of Dead Sheep where some 100 trapped Dall sheep died.

Some 270 kilometers of the South Nahanni River, one of North America's finest wild rivers, runs through the Park covering a seventh of the river's 35,000 sq. km watershed which drains via the Liard River into the Mackenzie basin. The South Nahanni and its tributary, the Flat River, are older than most of the mountain ranges through which they cut. Within the Reserve the river drops 475 meters overall, over Virginia Falls in a spectacular drop 92m high - almost twice the height of Niagara - then runs for 70 kilometers through a series of four canyons from 460 to 1200m deep, and through karst

terrain with grottoes, sink holes, labyrinths, closed canyons and an underground river system. The river level is low in winter but, following the spring thaw, there are high flow levels and flash floods from June to September (Parks Canada, 2001).

CLIMATE

Cold continental with wide monthly variations in temperature and precipitation: maximum and minimum temperatures recorded at Fort Liard are 34°C and -46.7°C respectively. From June to August the mean maximum and minimum temperatures at Tungsten, 35km west, are 17°C and 6°C; the absolute maximum and minimum for these months are 30°C to 0°C. Average June to August monthly precipitation is between 60 and 90mm, with severe thunderstorms in July. Temperatures decrease and precipitation tends to increase with elevation. Snow may fall at any time of the year (Parks Canada, 2001)

VEGETATION

The Park contains vegetation types of two major biomes, Nearctic boreal forest and Nearctic alpine tundra with transitional stages between. All stages of boreal forest occur, from recent burns to mature spruce forests, and from wet lowlands to alpine tundra. Over 700 species of vascular plants and 325 species of bryophytes have been identified within the Park, the richest diversity of vegetation of any comparable area in the Northwest Territories. This is due to the presence of highly specialised habitats such as hot and cold mineral springs, waterfall mist zones, wet calcareous substrates and unglaciated terrain. Densely growing white spruce *Picea glauca* and poplar *Populus* sp. dominate valley bottoms. At higher altitudes and on the northern slopes, black spruce *Picea mariana* is more prominent, and in the west, lodgepole pine *Pinus contorta*. There is an area of spruce-larch/lichen taiga with several orchid species near Virginia Falls. Alpine tundra characterised by sedges *Carex* spp., lichens, grasses and shrubs occurs on the higher mountains of the Tlogotsho, Headless and Funeral ranges. Wild mint *Lamium* sp., golden rod *Solidago* sp., yellow monkey-flower *Mimulus guttatus* and the endemic aster *Aster nahanniensis* are among the many flowering plants that grow in abundance beside mineral springs near Flat River (Scotter & Cody, 1974; Steere *et al.* 1977; Parks Canada, 2001).

FAUNA

The wildlife is diverse for the relatively high latitude of the Park, and adapted by seasonal movement or hibernation to its severe winters. 42 species of mammals are present including beaver *Castor canadensis*, grey wolf *Canis lupus*, grizzly bear *Ursus arctos*, black bear *U. americanus*, otter *Lutra canadensis*, wolverine *Gulo gulo*, lynx *Lynx canadensis*, woodland caribou *Rangifer tarandus caribou*, moose *Alces alces*, white-tailed deer *Odocoileus virginianus*, mountain goat *Oreamnos americanus*, Dall's sheep *Ovis dalli*, and a wide range of rodents. A total of 180 species of birds in 29 families have been observed including peregrine falcon *Falco peregrinus anatum*, golden eagle *Aquila chrysaetos* and bald eagle *Haliaeetus leucocephalus*. A small population of trumpeter swan *Olor buccinator*, a rare species in Canada, nests on Yohin lake. There are no known reptiles and few amphibians. 16 species of fish are known. Arctic grayling *Thymallus arcticus signifer*, Dolly Varden trout *Salvelinus alpinus malma*, lake trout *Salvelinus namaycush* and bull trout *Salvelinus confluentus* are common in the streams that flow into the Nahanni and Flat Rivers (Parks Canada, 1987). The karst cave fauna is unstudied, may be unique, and would be easily killed by pollution (Ford, 2005).

CONSERVATION VALUE

Nahanni National Park Reserve is an outstanding example of northern wilderness rivers, canyons and alpine tundra. It protects an area of national significance representative of the Mackenzie Mountains Natural Region, a WWF Global 200 Eco-region. Just to its north is a subarctic karst landscape unique in the northern hemisphere.

CULTURAL HERITAGE

There are signs that prehistoric man used the area of the Park. The original inhabitants were the Goat or Mountain Indians known as the Kaska who were living there when the Northwest and Hudson Bay fur trading companies established their posts along the Mackenzie River in the 1820's. They have been replaced by the Mountain Dene tribe of the Deh Cho (Big River) First Nations, a Slavey-speaking people (Parks Canada, 2001).

LOCAL HUMAN POPULATION

Some 100 Nahanni Denes follow a traditional way of life at Nahanni Butte at the junction of the South Nahanni and Liard rivers at the southern end of the Park but it has no residents apart from the seasonal camps of Aboriginal hunters. A road reached Fort Liard from the Alaska Highway only in 1979 and by 1981 the population around the Park was approximately 2,000. Fort Liard and Jean Marie are 90% indigenous communities of Denes and Métis (people of mixed blood); Fort Simpson (981 inhabitants) is almost equally split between native and non-native residents; Tungsten (380), a private company mining settlement west of the Park, is ethnically non-native. These settlements rely on a varied range of economic activities: staging for oil and gas exploration, mining, mining industry services and staging, commercial logging and sawmilling, air and road transport and handicraft production (Parks Canada, 1987; 2001).

VISITORS AND VISITOR FACILITIES

The visitor season is short, the peak period being during July (36%) and August (53%) with 89% of the visitors. Approximately 1,350 people visited the Park in 1993 and 1,018 in 2003. There are fire-fighting and portable waste facilities to keep the wilderness undegraded. Visitor facilities are few, but include trails and viewpoints and two floatplane docks at Virginia Falls, four campgrounds at Rabbitkettle Lake and Portage Landing, Virginia Falls and Kraus Hotsprings. Park staff at the first two sites provide interpretative services and guided hikes. There is an interpretive exhibit at the Fort Simpson Visitors' Information Center where trips to the Park must be registered. Whitewater canoeing, kayaking, hiking along a riverside track and one-day aerial visits are all popular. Aircraft charter from local towns is the most popular and practical means of access and scheduled air services are available from Fort Simpson, Watson Lake and Fort Nelson to Rabbitkettle Lake and Virginia Falls (Parks Canada, 2001; 2004).

SCIENTIFIC RESEARCH AND FACILITIES

Some 26 research programs were recorded between 1979 and 2003, systematised in the Research Description and Analysis Record under geology, limnology, wildlife, vegetation and cultural studies. Subjects covered included faunal inventories, radio-collaring woodland caribou, bear habitat and hazards, palaeozoological studies of Dall's sheep, bull trout, ecological land classification and an ecosystem monitoring program. There are no research facilities (PC, 2004).

MANAGEMENT

This was one of the first sites to be given World Heritage status, inspired by the threat of the development of a hydroelectric power plant at Virginia falls. It is managed by Parks Canada under the Canada National Parks Act of 2000 and the Parks Canada Agency Act of 1998 through the Agency's Guiding Principles and Operational Policies; also under the MacKenzie Valley Resource Management Act of 1998. The Park's administration is headquartered at Fort Simpson, and there is a year-round operations centre at Nahanni Butte. A management plan was first drawn up in 1987 and a new plan was approved in 2004. An interim Park Management Arrangement was also signed in 2003 between Parks Canada and Deh Cho First Nations representatives. The Park has been zoned: Zone I, Special Preservation, is an area where no motorised or manual facilities are permitted except to Aboriginal inhabitants. Seven areas in Nahanni including several hot springs, sheep licks and the Sand Blowouts are in this zone. Zone II, Wilderness, preserves wilderness environments and comprises the entire South Nahanni and Flat River corridors with the exception of the immediate Virginia Falls area and Rabbitkettle Lake. Zone III, Wilderness Recreation, is intended for areas maintained as natural environments, but which can sustain a selected range of low density outdoor activities; it includes Rabbitkettle Lake and Virginia Falls. The zoning policy takes native resource harvesting and other native traditional activities such as hunting, fishing and trapping into consideration (Parks Canada, 1987; 1994; 2004).

A 3,500,000 ha expansion of the Park, approved by the federal government is planned over the Tlogotsho Plateau, Ragged Range and the karst area north of Virginia Falls to better protect the ecological integrity of the limestone watershed which would be vulnerable to industrial development. The Deh Cho Process of the Deh Cho First Nations who represent native peoples of the MacKenzie

River basin is involving them with Parks Canada in the planning to preserve and extend the protected wilderness (Canadian Parks and Wilderness Society (CPAWS), 2001). Their land claims process will be used to help determine the extended protected area and buffer zones and to counter mining proposals upstream from the Park (IUCN, 2001). A formal largely annual Monitoring program has been established for some 20 topics including water quality, forest fire, bears and Dall's sheep, bird breeding and migration and visitors (Parks Canada, 2004).

MANAGEMENT CONSTRAINTS

The MacKenzie Valley Land and Water Board has still not resolved conflicts over land use and policy concerning the Park (UNESCO, 2002). At present, two-thirds of the South Nahanni River watershed is under long-term or temporary protection, leaving one third open to development. The present Park corridor omits most of the river's 3,500,000 ha watershed, with much habitat necessary to the area's wildlife and large areas of permeable limestone to its north. To mining and oil and gas exploration interests the region is a rich source of raw minerals awaiting development and there are several old mines and ongoing mineral explorations within the watershed. Moreover, the government organisation in charge, the Department of Indian and Northern Affairs, combines environmental protection with the promotion of the Territory's industrial development and has started issuing prospecting licences within the area (CPAWS, 2004). The Mackenzie River Environmental Impact Review Board has already approved licences for over 400 km of oil and gas seismic exploration lines in the area. In the event of floods or earthquake, to which the region is prone, mining in the Park's watershed would almost certainly pollute its waters with chemicals, fuels and sewage, affecting the caribou and Dall's sheep and the fisheries which have a relatively low natural productivity.

The Canadian Zinc Corporation has since 1983 held an abandoned zinc, lead, silver and copper mining prospect with fully developed infrastructure on Prairie Creek, a slot canyon tributary 15 km upstream, which it now wishes to develop and for which permits were issued in 2005. To access it, an improved 165 km all-season road is proposed across the exceptional karst landscape just north of the Park, without the preliminary environmental assessment on which the Mackenzie Valley Land and Water Board insist. Haul roads and mining could destroy the integrity of the site and poison the groundwater with contamination by the arsenic, antimony and abundant mercury in the ores. 40 tonnes of cyanide are stored on site and the toxic tailings pond is sited in a valley subject to flash floods and earthquake in an area where sulphuric acid pollution would travel long distances both overland and under the surface (Ford, 2005). Moreover, no relocation bond has been posted by the company. Proposed reopening of a tungsten mine which closed in 2003, 45 km up the tributary Flat River, also risks polluting the river. Park staff are working with stakeholders in the Greater Nahanni Ecosystem such as the Deh Cho and Sahtu First Nations to avert these potential threats. In 2003 an agreement was signed to withdraw most of the South Nahanni watershed from mining exploration for five years. The upper 20% of the South Nahanni watershed has already been proposed as a conservation area by the Sahtu (Parks Canada, 2001; CPAWS, 2001; 2004; CPAWS 2001; 2004; IUCN, 2002).

STAFF

7 fulltime plus 1 part-time, 6 seasonal and 7 others: administrative 3, resource management 4, general work 2, volunteers 5 (Parks Canada, 2004).

BUDGET

C\$278,000 (US\$200,000) is granted for operation and maintenance. The annual operating budget for 2003 was C\$1,200,000 (Parks Canada, 2004).

LOCAL ADDRESSES

The Director, Parks Canada, 25 Eddy Street, Hull, Quebec, K1A 0M5, Canada.

The Superintendent, Nahanni National Park, POB 348, Fort Simpson, NWT, XOE ONO, Canada.

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