10 Mackenzie Delta

Represented by: Ivvavik National Park and Pingo Canadian Landmark

PINGOS AND PERMAFROST

A spongy world of pingos and permafrost, of stunted spruce forests and treeless tundra, of more water than land. A maze of shifting channels, shallow lakes and ephemeral islands. A land, too, where the traditional and the modern exist side by side.

Mackenzie Delta

THE LAND:

Natural Region 10 comprises three distinct areas – the delta of the present Mackenzie River, remnants of earlier deltas to the northeast, and the Yukon Coastal Plain to the west. The coastal plain, about 20 kilometres wide, slopes gently to the Beaufort Sea. Permafrost is a dominant factor in this region, influencing vegetation and landforms.

The present delta, the largest river delta in the Arctic, is as flat as the sea. It is a tracery of islands and lakes, a labyrinth of channels and oxbows. Scores of pingos (cone-shaped hills with a core of ice) provide the only relief in this flat land. Here is found the highest concentration of pingos in the world. The tallest, Ibyuk Hill, is 40 metres high. Patterned or polygonal ground, like the pattern of cracks seen on newly dried mud on a giant scale, is a major feature of this region.

Pingo

This land has traditionally been populated by both Inuvialuit and Gwich'en Dene. With about 6,000 residents in various communities, this is also one of the most populated of the northern natural regions - a notable concentration given the small size of the region. This reflects the relative richness of the land.

VEGETATION:

Two types of vegetation dominate. Along the Beaufort Sea is the Low Arctic or tundra zone; inland and southward is forest-tundra.

The Low Arctic vegetation is typified by dwarf shrubs, sedges and herbs. On well-drained sites, woody species such as dwarf birch, willow, Labrador tea, alder and various species of the blueberry clan are typical; on wet sites, sedges and willows dominate.

The forest-tundra zone, as its name implies, is a mixture of trees and tundra. Here, open stands of stunted black spruce, white spruce and tamarack grow over a ground cover of dwarf tundra vegetation. These are the most northerly trees in Canada. The spruce here are commonly about three metres in height and 250 years old.

WILDLIFE:

The juxtaposition of tundra and forest in this region provides for a variety of wildlife not

often seen this far north. The tundra provides important summer range and calving grounds for caribou; the forest-tundra zone provides critical winter range. Black bears reach the northern limit of their range here. Red fox and arctic fox, wolves, grizzly bears, muskrat, beaver, lemming, rock ptarmigan, spruce grouse and raven are characteristic wildlife. Muskox are common. The delta is a critical staging and nesting area for shorebirds and waterfowl. Hundreds of thousands of snow geese stop at the outer delta islands and on the coastal plain each fall to accumulate fat for the long migration south, covering the land like a dusting of snow. Beluga whales congregate offshore. Farther out to sea in the Arctic Ocean, is an important migration route and feeding area for the rare bowhead whale.

STATUS OF NATIONAL PARKS:

About 2,400 square kilometres, or one-quarter, of the northernmost part of Ivvavik National Park extends into the coastal plain portion of the Mackenzie Delta Natural Region, protecting about 6 percent of the total region. It is dominated by the massive fan deltas of the Firth and Malcolm rivers draining north from the British Mountains and provides habitat

Belugas

for a variety of wildlife including polar bear, wolverine, golden eagle, peregrine falcon, gyrfalcon, and arctic char. The majority of muskox in Ivvavik are found on the coastal plain. The Canadian portion of the calving ground of the Porcupine Caribou Herd lies within this

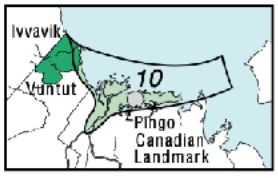
Ivvavik National Park

portion of the park. The coastal plain here is also a very important staging area for migrating snow geese.

None of the Mackenzie Delta, the namesake for this natural region, is included within the national park. The Babbage River delta, however, shares many of the same characteristics as the delta of the Mackenzie River, and part of the Babbage River delta lies within the park - the east shore of the river forms the park's eastern boundary. It is particularly important here to work through the Wildlife Management Advisory Council of the North Slope to manage the entire Babbage River delta in an integrated fashion.

Pingo Canadian Landmark is Canada's first, and only, landmark. Established through the Inuvialuit Final Agreement, this area is situated on the Tuktoyaktuk Peninsula and contains an outstanding concentration of pingos and other permafrost phenomenon, including Canada's highest pingo. The Pingo Canadian Landmark, through protecting these features, rounds out representation of the natural region.

See Natural Region 9 for details on establishment of Ivvavik National Park.



Major Land Uses
Caribou summering range
Geese nesting area - Herschel Island

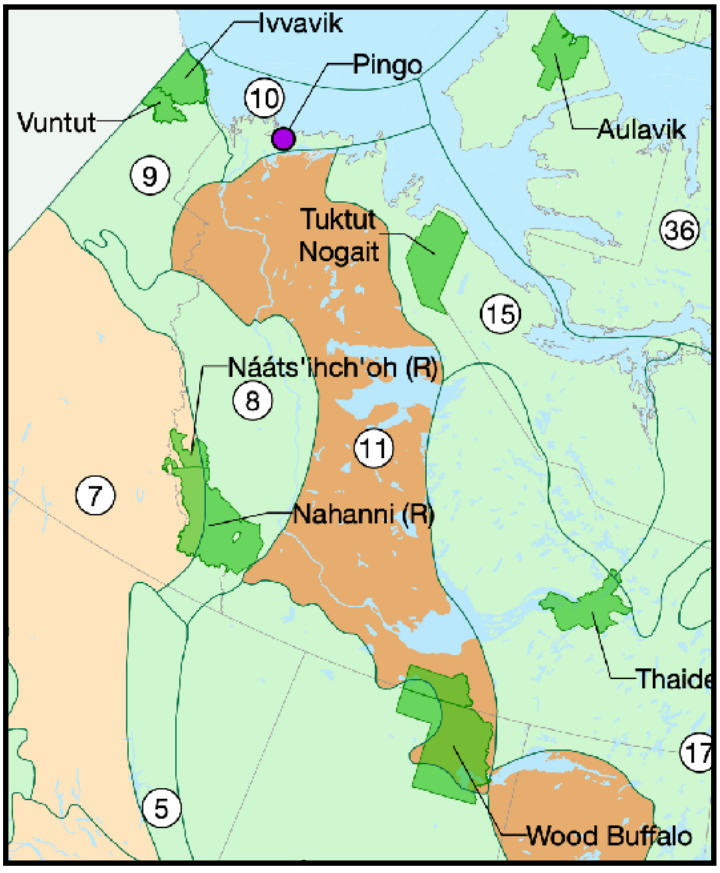
Main Communities
Inuvik
Aklavik
Tuktoyaktuk

Aboriginal Peoples
Gwich'in
Inuit

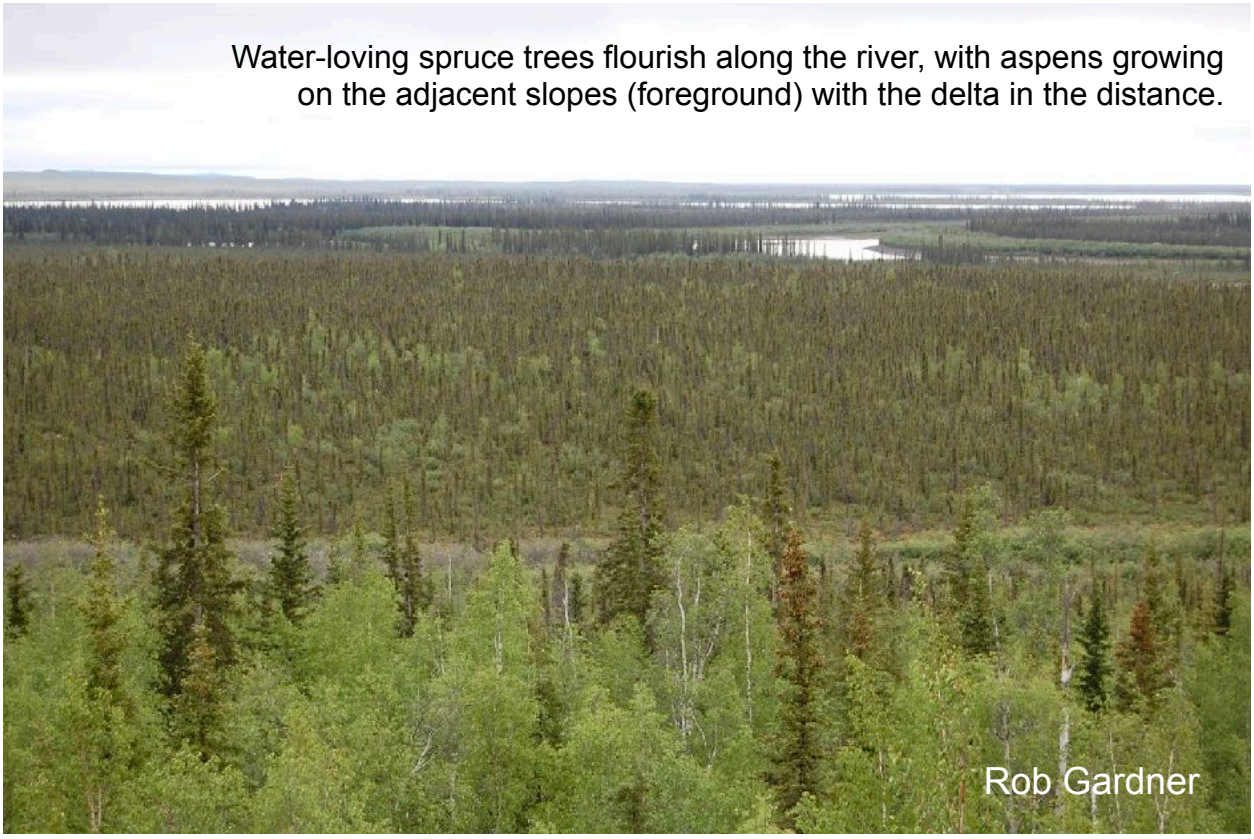
Parks and Natural Areas
Ivvavik National Park
Pingo National Landmark
Kendall Island Bird Sanctuary

Further Information

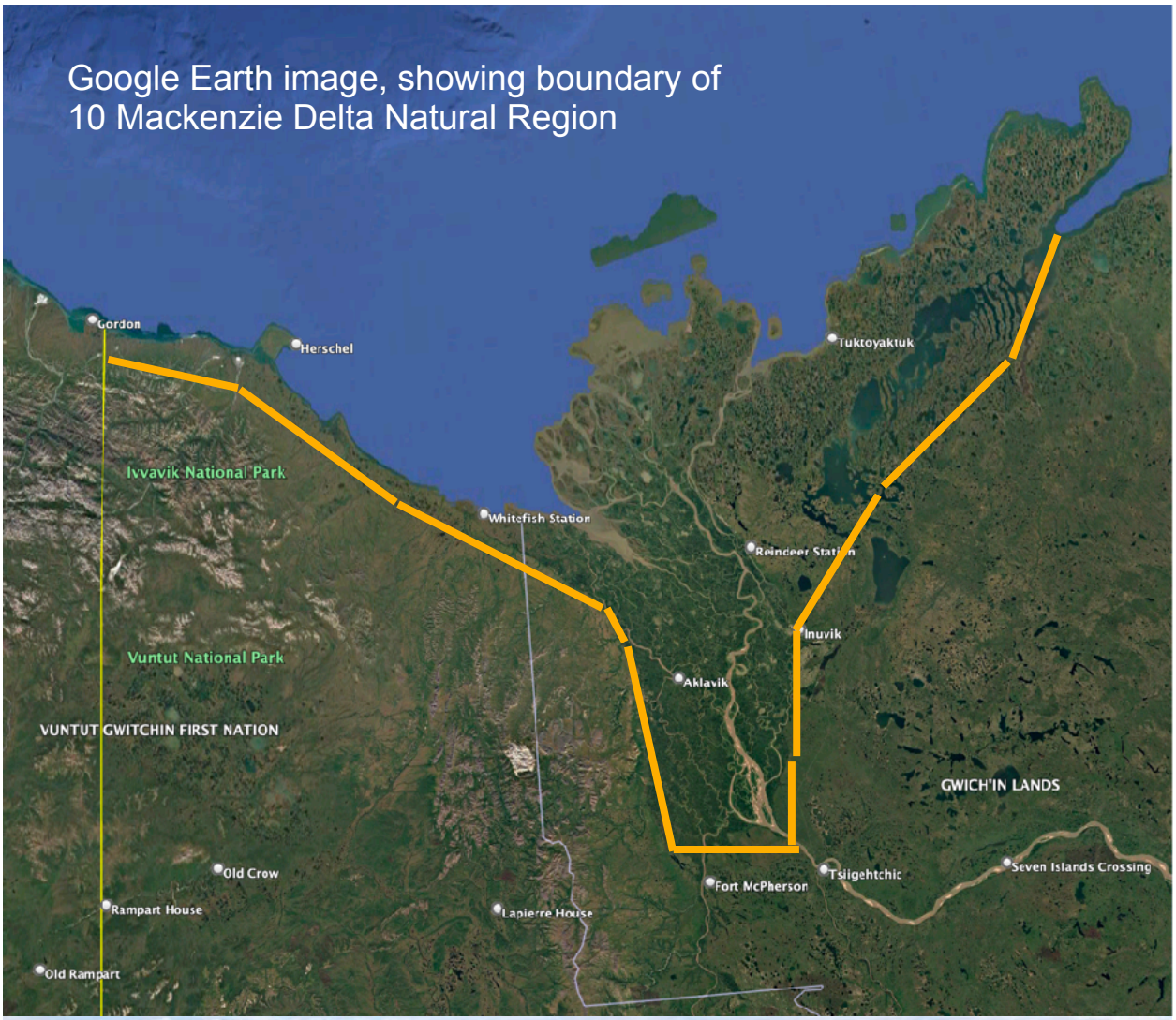
Regional map showing national parks



Just downstream of Tsiigehtchic, the slowing river has deposited the first of many islands.



Water-loving spruce trees flourish along the river, with aspens growing on the adjacent slopes (foreground) with the delta in the distance.


Google Earth image, showing boundary of
10 Mackenzie Delta Natural Region
Gordon
Herschel
Tuktoyaktuk
Ivvavik National Park
Whitefish Station
Reindeer Station
Inuvik
Vuntut National Park
Aklavik
VUNTUT GWITCHIN FIRST NATION
GWICH'IN LANDS
Old Crow
Fort McPherson
Tsiigehtchic
Seven Islands Crossing
Rampart House
Lapierre House
Old Rampart


Rob Gardner

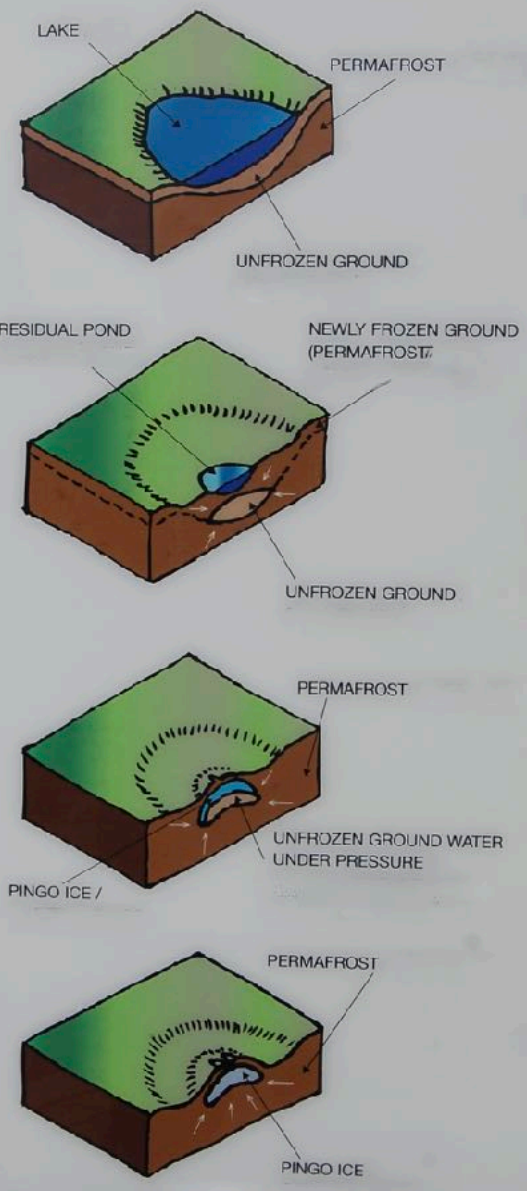
How Pingos Grow

A layer of unfrozen ground lies beneath most arctic lakes, since they are often too deep to freeze through to the bottom in winter. This year-round presence of water thaws the permafrost.

When a lake drains, a shallow residual pond is often left behind. The former lake bed begins to freeze, but the remaining water slows the development of the permafrost around it. As the lake bed freezes, the water in the ground turns to ice and expands. The extra water cannot escape, so it pushes inward toward the centre, ahead of the freezing front (see arrows).

The freezing front advances inward, placing the encapsulated "lens" of water under pressure. The thin layer of permafrost above the lens is pushed upward and the pingo begins to grow.

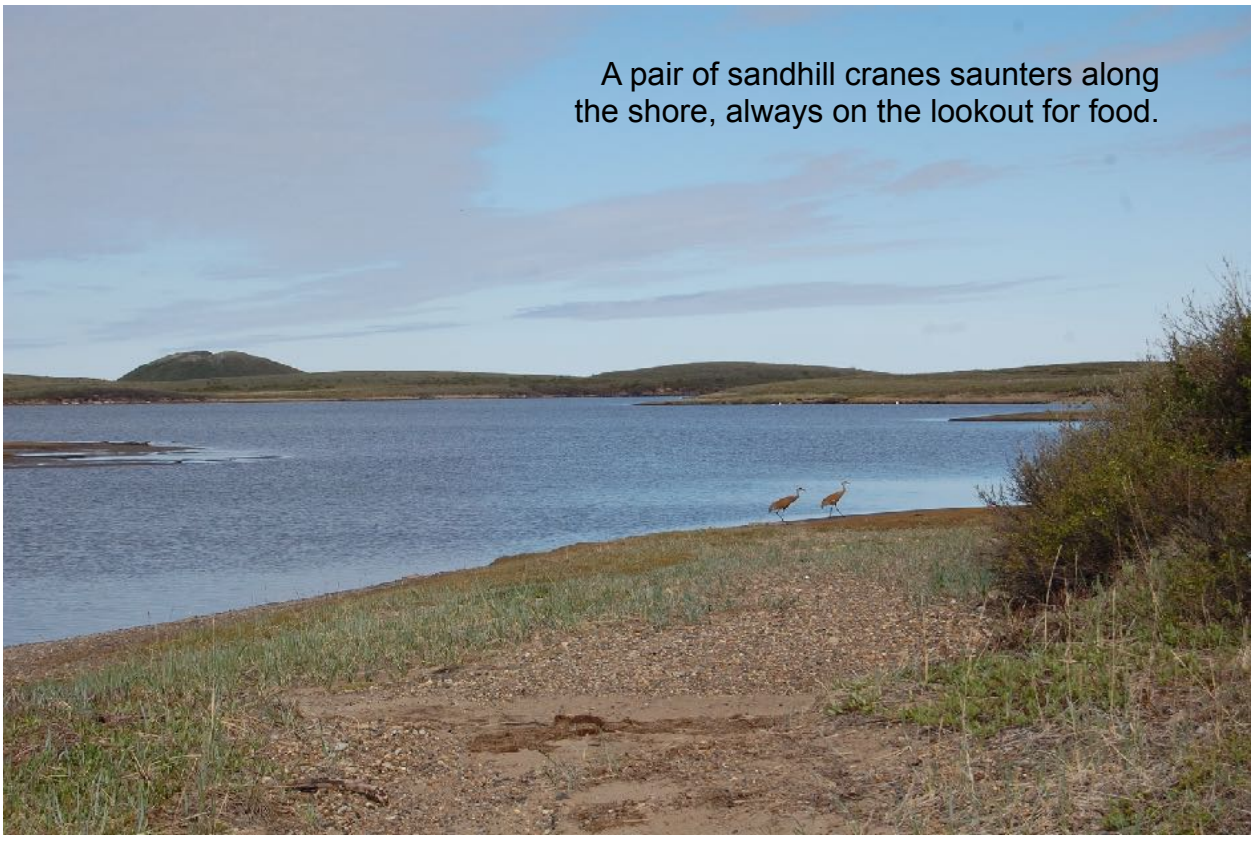
The pingo is fully formed and stops growing when it is frozen solid. The unfrozen ground becomes permafrost. Now the pingo's core is almost pure ice.



Radar units for both weather forecasting and national defence lie close to traditional land uses.

Permafrost traps moisture in layers of ice, as seen here. Some activity, perhaps the road construction, has disturbed the surface vegetation that generally insulates the ice. The melting exposes fresh surfaces of soil and ice, allowing these scars to spread far beyond the initial damage.

This up-turned sled is not abandoned; it's simply waiting a couple of months for the snow to return. The vegetation in the foreground is unnaturally lush, benefiting from the water flowing off the road.



A pair of sandhill cranes saunters along the shore, always on the lookout for food.