LEADING THE WAY

THE CONSERVATION OF NORTH AMERICA'S WILDLIFE

PART 2:

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THE GEORGE RIVER HERD WAS LIVING TESTAMENT TO GEORGE CALEF'S WORDS:

"CARIBOU HERDS ARE LIKE A GEOLOGICAL FORCE AS THEY FLOW OVER THE LAND... DOMINATING THE LANDSCAPE AND THE LIVES OF PEOPLE WHO HUNT AND DEPEND ON THEM."

Caribou are a species of superlatives. In Quebec-Labrador, this animal is the epitome of mobility, displaying some of the largest home ranges and longest migrations of any land mammal on earth. This animal represents the clothing and food that has supported human survival for millennia. This region is home to the George River herd—at one time, the world's largest caribou population. And the region exemplifies the versatility of caribou. Across the vast mix of taiga, tundra, peatlands and mountains, we find caribou living as secretive creatures of the boreal forest, as sure-footed inhabitants of montane environments, and as great migrators of the barrens.

Caribou also represent one of the most formidable challenges in conservation. In recent decades in Quebec-Labrador, most caribou populations have fallen, by as much as 99 percent. These declines are reiterations of a worldwide trend. Nevertheless, the synchrony in trends implies that our knowledge about caribou in this region might inform conservation efforts elsewhere.

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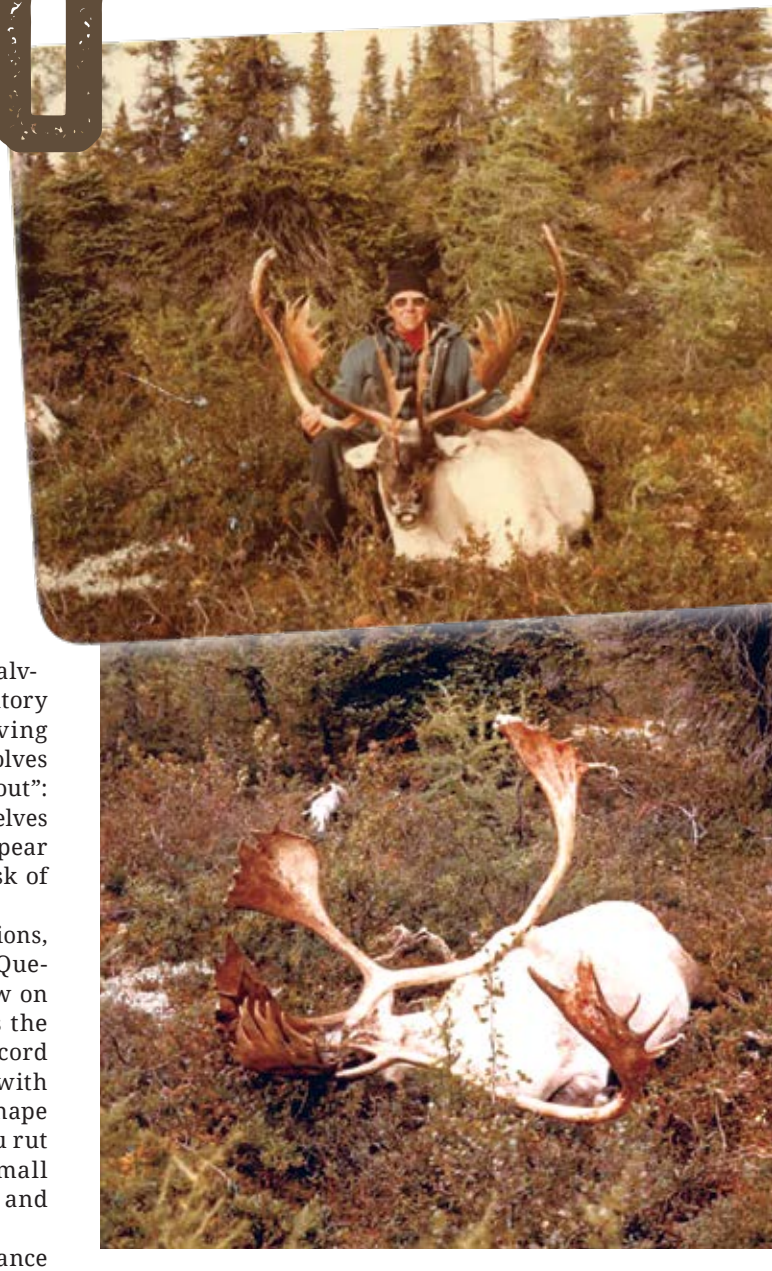
QUEBEC-LABRADOR CARIBOU



In 1974 Robert S. Carroll was hunting near George River Lodge, Quebec and harvested this Quebec-Labrador caribou, scoring 396-4/8.

ONE REGION, TWO KINDS OF CARIBOU

Key to understanding caribou—whether their movements, dynamics, or appearance—is recognizing two kinds of caribou, often called the migratory ecotype and sedentary ecotype. Although biologists generally agree on these designations, the labels may vary. Migratory caribou are sometimes referred to as "barren ground" or "forest-tundra" caribou. Sedentary caribou may be called "woodland," "forest dwelling," or "boreal" caribou.

The fundamental distinction between the ecotypes is the calving behaviour of females. In the words of Tom Bergerud, migratory females "space away": In spring, they trek to traditional calving grounds north of treeline where they distance themselves from wolves and gather to give birth. In contrast, sedentary females "space out": In spring, they scatter into the boreal forest where they make themselves rare to predators and give birth in solitude. Both behaviours appear ingrained; both are interpreted as strategies to reduce the risk of predation on calves.

Arising from this behavioural difference are other distinctions, including differences in form. The antlers are distinctive. In Quebec-Labrador, migratory males display brow and bez tines low on the main beam and without a rear tine; the inside spread is the greatest of any North American caribou, nearly four feet for a record specimen. In contrast, sedentary males feature shorter beams with relatively larger brow and bez tines. Such differences in antler shape can be traced to the size of the rutting group. Migratory caribou rut in large, moving aggregations. Sedentary caribou breed in small companies and contact their adversaries more with the brow and bez tines. Occasionally, they may lock antlers.

The ecotypic distinctions are more than matters of appearance or curiosity. They are expressed in population dynamics—in particular, in what limits caribou numbers. Consequently, they guide the strategies for conserving caribou.

DEMOGRAPHY, THE FOUNDATION OF CONSERVATION

More than a half-century ago, Tom Bergerud recognized the scientific importance of the George River herd in northern Quebec-Labrador. He understood that this herd could serve as "a unique opportunity to explore natural population controls."

In this and many things caribou, Tom was prescient. In the decades that followed, scientists learned much about caribou demography by documenting the rise and fall of the George River herd. The herd's ascent was stunning—from 15,000 animals in 1958 to become the world's largest herd, an astounding 823,000 animals in 1993. This represented sustained growth of almost 12 percent per year, a magnitude of change never witnessed by scientists. During the photo-census in July 1993, for instance, biologists counted 358,460 individuals, including one group of more than 52,000 animals.

By their sheer numbers, caribou have immense ecological gravitas. Each year, a herd of a quarter-million caribou removes 235,000 tonnes of forage, produces 5,000 tonnes of methane, and scatters 70,000 tonnes of fecal nutrients across its range. The George River herd was living testament to George Calef's words: "Caribou herds are like a geological force as they flow over the land...dominating the landscape and the lives of people who hunt and depend on them."

But no population grows forever. By the late 1980s, evidence was mounting that herd growth was nearing its end. Females were smaller in stature; pregnancy rates had dropped. But few biologists anticipated the precipitous descent to come. By 2016, the herd fell to only 8,900 animals—a 99 percent decline in less than a quarter century. The adjacent Rivière aux Feuilles herd followed a similar trajectory, albeit less pronounced—from 56,000 individuals in 1975 to 628,000 individuals by 2001, then 199,000 individuals in 2016. Not surprisingly, the count of Boone and Crockett records mirrors the fall in caribou numbers. During 1989 to 2010, the average number of new records for Quebec-Labrador caribou was 14 entries per year. Since then, just a handful of records have entered the books each year.

Nor have the caribou declines ceased. This trend represents a major reason why the "eastern migratory" population, which includes northern Quebec-Labrador, was classified in 2017 as endangered. The Torngat Mountains population—caribou that inhabit the montane region east of Ungava Bay—were deemed endangered in 2016.

Why these declines? We have learned that migratory caribou often show striking changes in abundance that unfold over decades, reaching densities of more than one animal per square kilometer. Although wolf predation is important, food tends to be the principal limiting agent, especially as populations approach high density. The peak of the George River herd, for example, was associated with degradation of high-quality foods, such as lichens and dwarf birch, owing to foraging and trampling on the summer and calving grounds. This idea was revolutionary—that summer, rather than winter food was regulatory for caribou. The recovery of forages may take decades. As a result, long-term swings in abundance are typical for migratory caribou.

But what of sedentary caribou? Here, the distinction between ecotypes is crucial. The demography of sedentary caribou, the year-round residents of the boreal forest, stands in contrast to their more northerly, migratory counterparts.

Sedentary caribou are in trouble—a decline that has been relentless for 150 years. Although their population densities are typically low and unchanging (about one animal per 16 square kilometers), this decline shows a clear geographic signature. These forest-dwelling caribou have vanished from the southern margin of their range across much of the continent. In Quebec-Labrador, with the exception of the isolated and endangered Atlantic-Gaspésie population (just 75 animals), caribou no longer exist south of the St. Lawrence River. A broad

QUEBEC-LABRADOR CARIBOU BOUNDARY LOCATION FOR RECORDS KEEPING PURPOSES

Scott A. Cooper took this Quebec-Labrador caribou, scoring 382-4/8 points, in 2017 while hunting near Lac Bienville, Quebec.

swath of boreal forest in eastern North America—nearly 300 miles wide, including the Maritime provinces and nearby New England states—is now entirely or largely devoid of caribou. Sedentary caribou, part of the "boreal" population, were designated in 2000 as threatened.

Again, we need to understand why. For forest-dwelling caribou, while the immediate limiting factor is often predation, the ultimate cause can often be traced to habitat disturbances. Industrial changes to the landscape, such as logging, favour other deer species, like moose and white-tailed deer, which in turn support more predators, like wolves and black bears. In addition, invading white-tailed deer may transmit a meningeal worm, a parasite lethal to caribou.

It is a crisis in slow motion. Over decades, the disappearance of caribou in the boreal forest has mirrored the northward march of roads and industrial encroachment. These declines are continuing; the losses are likely permanent. There is no evidence that, once extirpated, sedentary caribou reoccupy such lost ranges, even when reintroduced.

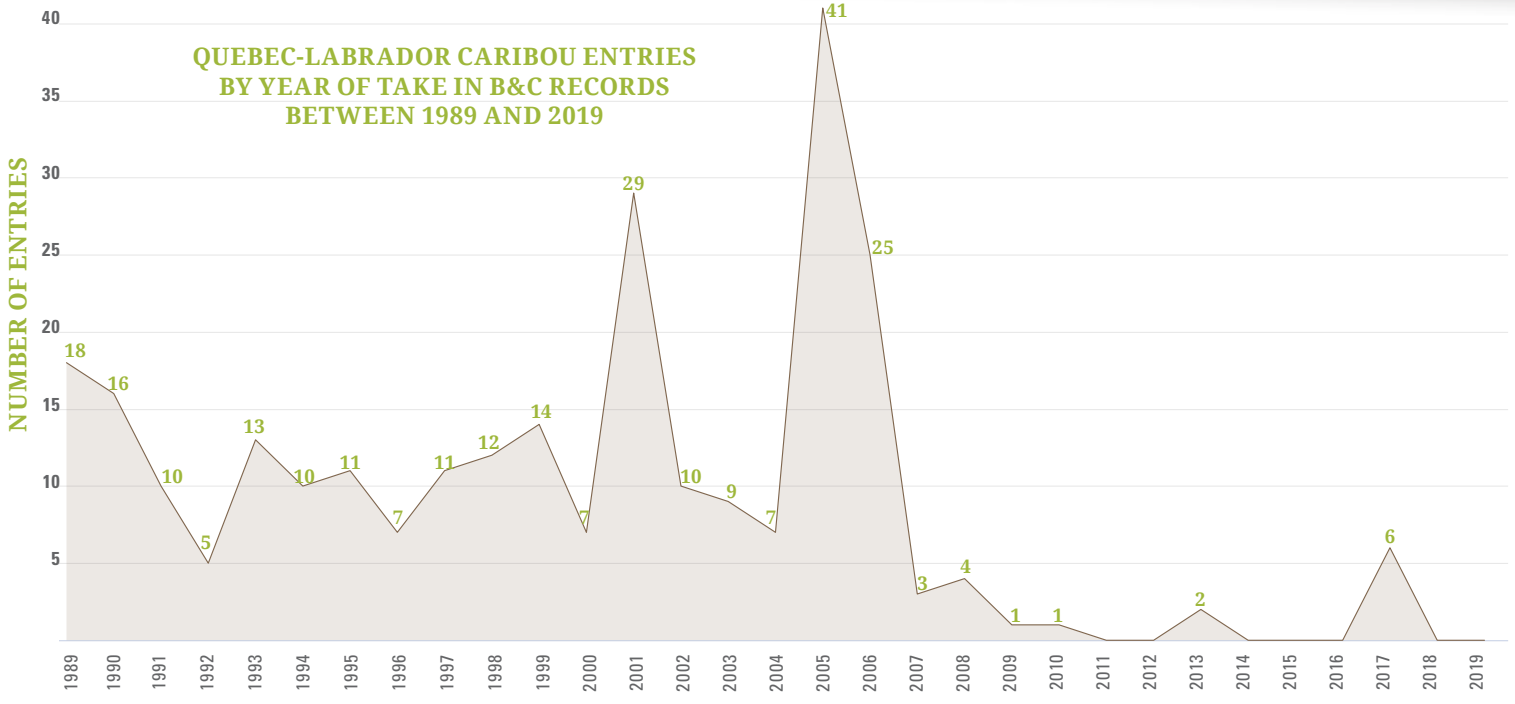
CONSERVATION, A MATTER OF SCALE

For caribou, the need for vast spaces represents the crux of an immense conservation challenge. The mobility of caribou is evident, even in the units we use to express it. A typical home range (the area traversed by one animal) is measured in the hundreds or thousands of square kilometers. A typical population range (the area used by a herd in aggregate) is measured in the tens or hundreds of thousands of square kilometers. At its peak, the George River herd occupied 700,000 square kilometers—an area the size of Texas.

Habitat is key. But to achieve conservation success, we must recognize that habitat and caribou are entwined in a long-term, dynamic relationship. The traditional calving grounds of migratory caribou often shift in size and location over several decades. The forest habitat of sedentary caribou becomes suitable 40-50 years after fire. These long-term dynamics outstrip the time horizon of conventional wildlife management plans, even the careers of most wildlife managers. They represent serious mismatches in scale. As a starting place, keeping caribou means dispensing with short-term, piecemeal perspectives to managing populations and their habitat.

In its place, we need to scale up our plans and desires to match the biology of this animal—on time scales of multiple decades, on spatial scales of whole landscapes. Founded in strong ecological understanding, a bright future for caribou is clear: To conserve caribou, we must adopt a caribou's eye view. ■

This Quebec-Labrador caribou, scoring 414 points, was taken by James E. McCarthy (right) near George River Lodge, Quebec, in 1974.



WORLD'S RECORD

TROPHY STATS

SCORE: 474-6/8

LOCATION: NAIN, NEWFOUNDLAND

HUNTER: ZACK ELBOW

OWNER: B&C NATIONAL COLLECTION

DATE: 1931

KEY MEASUREMENTS:

LENGTH OF MAIN BEAM: RIGHT 60-4/8 - LEFT 61-1/8

INSIDE SPREAD: 58-2/8

LENGTH OF BROW POINTS: RIGHT 14-4/8 - LEFT 21-2/8

NUMBER OF POINTS: RIGHT 22 - LEFT 30

Zack Elbow's World's Record Quebec-Labrador caribou was donated to Boone and Crockett's National Collection of Heads and Horns in 1951.

This fine caribou trophy, and the story behind its discovery, makes a person wonder how many potential big-game world's records were taken by Canada's native Inuit during their long tradition of hunting in North America. This is one of the few specimens of the rare caribou race from Labrador. It was shot by native Inuit Zack Elbow, near Nain, Canada, during the winter of 1931 and later picked up by Charles Ray Peck, who recorded the following account of his find.

"During the summer of 1932, I was cruising home from Norway on a chartered Norwegian sealing vessel," Peck said. "When we reached Nain, a small village on the Labrador coast, we had our first sight of trees and of continental North America. So we decided to explore a fjord that ran inland for, perhaps, 50 miles to the northwest. As a sort of guide, we took along from the village an Eskimo named Zack Elbow, for we had gathered that we might see some caribou and find some good trout fishing. We stayed at the head of the fjord for several days. While some of the party were enjoying the fishing, my friend, Hoff Benjamin, and I went caribou hunting with the Eskimo, who understood no English.

"Mosquitos were extremely bothersome, but the first day we saw two or three small caribou, which I did not shoot," Peck said. "This seemed to irritate the Eskimo. However, by the next day I had succeeded in conveying to him that I was hunting for 'big Tuktu.' So we proceeded overland, I would say about 12 miles, to a spot where Zack had shot a couple of bulls, for meat, during the previous winter. When he led us to this place I could see two huge heads lying on the ground, 50 yards away. Foxes, of course, had eaten everything that Zack had left, except the bones. We tossed a coin to see whether Benjamin or I would be the possessor of the larger head. I won."

Presented by Peck to the Boone and Crockett Club's National Collection of Heads and Horns in 1951, this head, scoring 474-6/8 points, is the largest caribou rack ever recorded. As the picture above shows, these Quebec-Labrador heads often differ markedly from caribou races in the western part of the continent. ■

NOTE: The people of the Canadian Arctic used to be called Eskimos. They are now called Inuit. Peck's Eskimo references date to a time when that collective term was used frequently.

Today you can see the current World's Record on display in the National Collection of Heads and Horns at Johnny Morris' Wonders of Wildlife National Museum and Aquarium in Springfield, Missouri.