

A Caribou Year: A Scientist's Activities

Wintering Grounds - November to February

Before 1990, caribou scientists were restricted in their travels by cold temperatures and dark arctic winters, so they only flew occasional surveys during the winter to see where the caribou were. Today, scientists depend mostly on satellite collars to provide a general picture of where the caribou are. These collars send a signal directly to a satellite in orbit around the earth. The satellite then relays the caribou's location to the scientist's computer. Sometimes in early winter, caribou scientists work with local hunters to gather biological samples from the animals they have killed for food. These samples help monitor the general health and condition of caribou in the herd.

Early winter is often a time for using helicopters to live-capture caribou in order to put on radio-collars or replace old collars that have failing batteries. In other areas, scientists use dart guns and drugs to capture large animals like caribou. Many people depend on harvesting Porcupine Herd caribou for subsistence food, however, and the hunting season runs almost all year long. Because there is a several-week waiting period before drugged animals are considered safe for humans to eat, scientists don't use drugs on Porcupine Herd caribou. Instead, they use net guns that fire a large net over the caribou to tangle it up. The scientists can then handle the caribou, weigh and measure it, draw a blood sample, and put a collar on it without having to use any drugs.

Spring Migration - March and April

Late winter and early spring is a time when scientists use helicopters and net guns to capture and collar caribou. It is also when scientists try to estimate the number of calves which have survived the winter. Sometimes these researchers use ski-equipped airplanes or helicopters to land near migrating caribou and count them as they go by, classifying them as adult females, adult males, or calves. More often, though, the scientists use a helicopter to fly low behind groups of caribou. Many more animals can be counted and classified in this manner, and much more quickly. The scientists try to finish each group of caribou as rapidly as possible so the caribou don't run too fast or too far and wear themselves out. Winter is a hard time for caribou, as food is often scarce or hard to get at, so scientists don't want to stress the caribou any more than they have to. The scientists calculate how many calves there are for every 100 cows, and compare this to the data they collected in the summer. From the difference, they can estimate calf survival through the first winter.

Caribou Scientists also try to predict how many calves will be born in the coming summer, and how healthy these new calves will be. The scientists work with local hunters to get biological specimens from caribou they've hunted for food in the spring. These spring data usually help scientists determine how well the caribou have fared over the winter and can help predict the level of calf survival during the next calving season. Pregnant cows in good shape will give birth to more vigorous calves that survive better. Pregnant cows in poor shape at the end of winter will probably still give birth, but their calves may not be able to survive the critical first year of life because of its small size.

Most fieldwork occurs early in spring migration. Afterwards, caribou scientists return to their offices to analyze data, write reports, and plan for the upcoming summer field season. They rely on the satellite collars to indicate where the herd is and how migration is progressing.

Calving Grounds - May to Mid-June

Calving is a busy time for caribou scientists. Since the early 1970s, scientists have been traveling to the calving grounds of the Porcupine Herd to observe exactly where and when the calves are born each year, and to find out how well the calves survive. There are no roads in the calving grounds, and the caribou are spread out over vast distances of 100 miles or more. Therefore, scientists must use airplanes to find and follow the caribou. To get a general idea of where the caribou are having their calves, scientists usually fly in a fast airplane like a 4-seater Cessna-185. The scientists use special radio receivers and antennas to track down radio-collared caribou. Usually they fly high, often one or two miles above the ground so that they have the best chance of receiving the signals, but they can still see caribou tracks and trails and even some caribou on the ground. Sometimes the scientists descend lower to get a better look. A fast airplane is especially useful along migration trails and toward the edges of the calving area, where caribou are very widely scattered.

For a closer look at caribou in the main calving area, scientists use a slow flying, highly maneuverable airplane like a 2-seater Piper Super Cub. In these planes, the scientists can slow down to about 40 mph and fly very close to the caribou. The scientists look for newborn calves, but they can also tell just by looking carefully at cows which ones have been pregnant. Both sexes of caribou grow antlers, but bulls and nonpregnant cows shed their antlers during winter or early spring. Some of those caribou may be growing new fuzzy or “velvet” antlers, but the only caribou that still have hard bony antlers at calving time are the pregnant females.

A few pregnant cows drop their antlers before calving, and some cows never grow antlers, so fortunately there is another way to tell whether a cow is pregnant or has already had a calf. Pregnant females develop a large udder full of milk, which the scientists can also see if they fly very close. The udder usually becomes obvious at least several days before a calf is born and will remain visible for some time even after a calf dies.

Scientists track all the radio-collared cows for a week or so in early June. They initially determine which cows are pregnant by looking for udders or hard antlers and then keep relocating the cows until they see a calf. Sometimes they watch a pregnant cow the whole time and never see a calf, but they then know the calf must have been born and died. Many calves die shortly after birth from birth defects, predation, and other causes. Therefore, scientists also go back to check on the calves they have seen, so they can determine which of those have survived through the early calving period.

Whenever the scientists spot a radio-collared cow, they record her exact position using a GPS (Global Positioning System). Later, back in the office, they can map where calving occurred, how caribou moved during the calving period, and what habitats they used. The scientists can also determine how calf survival was, related to all these variables.

Post-calving Groups - Late-June to July

Caribou scientists usually get to take a break back in their offices after their work during the calving period, but they return to the field in late June. They locate all the radio-collared cow caribou and see which ones still have calves. This gives the scientists a better idea of how calf survival related to calving

location.

In order to find out how many caribou are in the Porcupine Herd, every two to three years caribou scientists take advantage of the large post-calving groups to do a photo-census of the herd. To quickly find the large aggregations of caribou, scientists locate the satellite-collared and radio-collared animals to see where the aggregations are. All of the cows and calves and many of the bulls in the herd are usually in just a few huge groups on the coastal plain or in the foothills of the mountains. Most collars are put onto cow caribou, but a few radiocollars on bulls help the scientists track down those males who are not within the large aggregations, but who instead may be a hundred miles away in the high mountains, or even on the south side of the Brooks Range.

Once the large groups have been located, scientists use an airplane with a special camera to fly over and photograph the caribou. They use a computer connected to a Global Positioning System (GPS) to calculate the correct overlap between photos so that each group gets completely photographed. Eventually they have photos of every caribou in the herd, except for a few that have not joined one of the large aggregations. Sometimes, the scientists fly very intensively over the areas away from the large groups in order to locate stray caribou and estimate how many were missed in the photos. When that has been done, the estimate for additional caribou not in the photographed groups has always been very small, so scientists usually rely on just the photographs to count the herd.

In conjunction with the photo-census, scientists sometimes get on the ground near the large aggregations so they can use binoculars or a spotting scope to identify individual caribou by their sex and age. Those data can be combined with data from the radio-collared caribou to estimate the overall makeup of the herd.

Fall Migration - August to October

Sometimes scientists use boats to capture caribou at river crossings during fall migration. This usually occurs near Old Crow village in the Yukon. This is an easy and inexpensive way to put more radiocollars on caribou, provided the caribou come to the crossings, which isn't always the case. Scientists also cooperate with local hunters to gather biological samples from caribou that are harvested by villagers for food. If the samples show the caribou are fat and healthy, it usually means the pregnancy rate will be high and many calves will be born the next summer. Skinny or lean caribou mean that productivity will be lower.

Otherwise, caribou scientists usually don't do much fieldwork during fall migration, but they stay busy in their offices analyzing data from the summer. Scientists also go to meetings and work with the public to set hunting seasons for the caribou. Fall is also a likely time for counting the census photos. Scientists have to lay out the photos, draw lines so caribou on overlapped photographs only get counted once, and then laboriously count the caribou one by one. They use magnifiers, grid lines, and tally counters to keep track of the thousands of caribou. It's a big job to count over a hundred thousand caribou!