

Alaska Sponsors Problem Analysis of Denali Caribou Decline

By F.J. Singer

On November 29-30, 1983, the Alaska Region brought a group of biologists together in Anchorage to conduct a problem analysis of the reason(s) for the decline of the caribou herd at Denali National Park and Preserve. A nine-member committee was formed, consisting of some of the most experienced and respected caribou researchers and managers in western North America, including: A.T. Bergerud (University of Victoria), Glen Ellison (Arctic National Wildlife Refuge), Frank Miller (Canadian Wildlife Service), Mitch Taylor (University of British Columbia), and Raymond Cameron, James Davis, Al Franzmann, and Bob Pegau (Alaska Department of Fish and Game), along with Francis Singer (Alaska Regional Office, NPS). The committee heard seven speakers discuss caribou movements, reproduction, and habitat studies at Denali, and then met in closed session November 30 to review the problem.

Naturalists, including Olaus Murie, had crudely estimated in 1943 that the Denali herd then numbered 30,000 animals, but by 1963-66 it numbered as few as 8,000 and stood at only 1,000-1,200 by 1974. Accurate total counts were impractical after 1975 because of herd dispersal, however aerial trend counts on a southern post-calving ground suggest further downward trends of about five percent per year from 1976 through 1983. This continued reduction occurred while several adjacent herds (Delta, Nelchina, Mul-

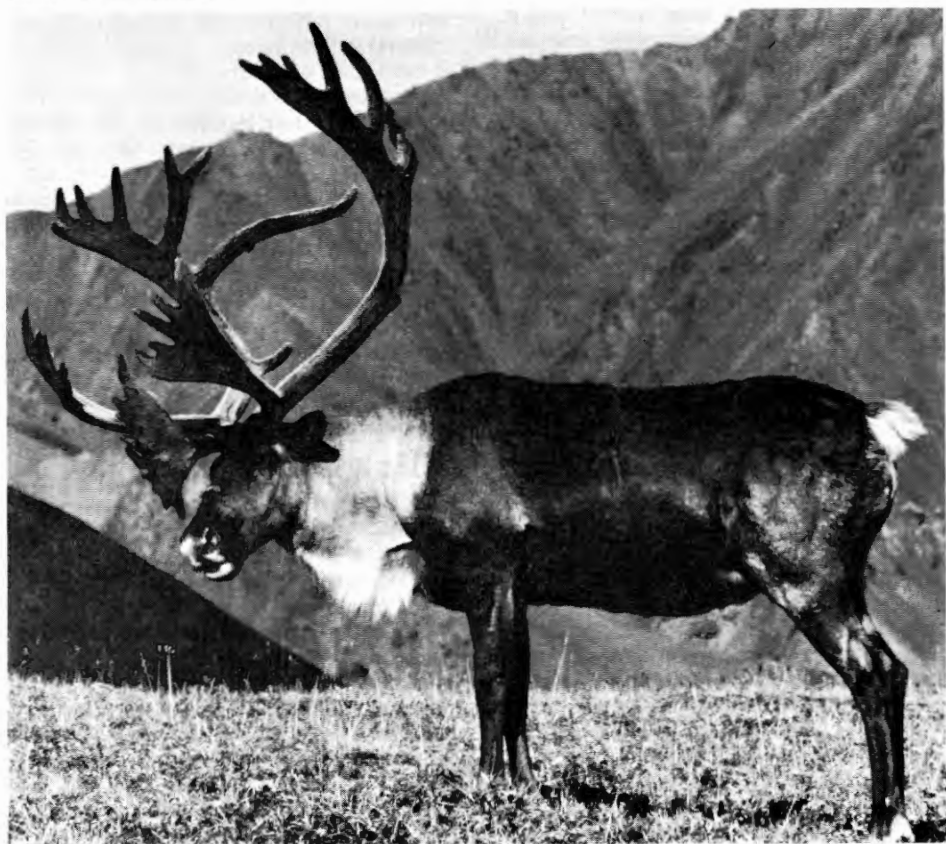
chatna) experienced strong growth and multiplied two- to several-fold.

Low Calf Recruitment

The committee considered the recent, continuing reductions, 1976-83, and the catastrophic early herd declines, 1943-74; their consensus, based on study findings was that recent reductions result from very low recruitment of calves (23-28 calves per 100 cows). The June calf crops are only about half those in healthier herds and a third those of herds expanding very rapidly. Unknowns include, are few calves born, are they born weak and sickly, or are they killed by predators? Several observed aspects of the herd's calving indicate predations on young calves may be responsible, primarily by wolves and bears (probably both blacks and grizzlies). Cows isolate themselves on steep mountain slopes to calve, which was interpreted as predator-avoidance strategy, and there is some indication numbers of new-born calves reach very sharp peaks then decline rapidly, the usual pattern if predators are active and effective in a herd. Calf crops were particularly low in northern calving areas, where wolves and grizzlies are much more numerous, than in the south. Predators are also abundant along migration routes in the park interior, and drastically low calf crops were documented for caribou which calved in the north, then moved south through the park with very young calves at heel.

Despite the indirect evidence, few predator kills or

Alaska caribou: Is their decline at Denali natural or is it in any way human-caused? Research team members search for the answers.



caribou carcasses are observed. Based on studies elsewhere, the committee explained that many losses occur while calves are only a few hours or days old, which is prior to the usual calf ratio counts. Predators consume nearly all of a calf carcass and wolves carry remnants to their dens. Also, wolves typically hunt alone and at night when preying on caribou calves.

Predators Not Blamed

Whatever the reasons for present herd reductions, the committee believed the park's predator populations were not nearly large enough to have caused the earlier, more dramatic declines. Limited by the dearth of early information, the committee could not agree on causes for those declines, but theories include herd emigration/dispersal, winter kills (probably a factor in 1970-72 when many Alaska herds drastically declined), and possible heavy hunter harvests south of the park in the 1960s. Two theories, which can be tested but have less to support them, are heavy metal poisoning at licks, and poor physical condition of adults. Poor condition of cows may have contributed to low calf survival earlier, but studies indicate the herd is in good physical condition now with high availability and use of lichens, short feeding bouts, long nursing bouts, low insect harassment, and high nutrient content of forage.

The committee made recommendations for research into the herd's decline and for long-term monitoring of key population and demographic parameters. All recommendations, particularly for monitoring, are beyond the present financial and staff capabilities of the park, but with recently obtained Significant Resource Problem (SRP) funding from the Washington Office research will intensify this year. Park and Regional personnel are now refining strategies based on the committee's recommendations. They include obtaining information on the poor calf crops by making udder counts of cows from a helicopter as an evaluation of pregnancy rates (which is as difficult to do as it sounds), documenting actual calving sites, determining antler retention rates of cows as an index of pregnancy (pregnant cows usually retain antlers longer than those not pregnant), placing mortality-sensor collars on a sample of neonatal calves, and radio-collaring wolves. Other recommendations were for long-term monitoring of bull ratios as an index of population dynamics, recording snow depths on wintering and calving areas, attempting total herd counts, and measuring trends in wolf and moose numbers. Wolves may use moose or Dall sheep as alternate prey if caribou decline further, which could delay or prevent the wolf population from declining along with the caribou. Good data are available on the sheep population.

Decline Causes Sought

A primary concern of management is whether the caribou reductions and lack of recovery are natural or in any way human-caused. Even if they are completely natural, NPS will have need for some factual answers if the population slides to zero! Some sources speculate park facilities and activities, including past caribou research, contribute to the declines, and heavy hunter harvests south of the park may well have been a factor. The herd is not hunted now but could be again, outside of the old core park, if it increases sufficiently. The caribou make use of an abandoned mine site as a lick, which will be tested for heavy metal concentrations and, if necessary, covered over.

Hunter harvests of adjacent herds may greatly influence the future of the Denali herd. According to a published hypothesis that has drawn mixed reactions from caribou biologists, when caribou herds grew to

extremely large sizes, segments naturally broke away and dispersed or emigrated to adjacent herds. Emigration from the Denali herd when it was at or near its peak may have contributed to its decline. Immigration from nearby herds to the Denali herd could help it "escape" from its present critical situation but is unlikely because present State management goals for those herds include maintenance of stable populations through hunting harvests. Predator control was attributed by State biologists as triggering increases in those herds from previously low levels. Caribou herds at very low population levels sometimes become erratic in their migration and the possibility exists that all or part of the Denali herd might emigrate.

Another concern of management is to assure caribou protection in upcoming decisions on mining and mine access improvements proposed for the Dunkle and Kantishna Hills areas of the park additions, in other proposals for visitor access and facilities, and in closure of areas to mechanized transportation. Knowledge of factors affecting the herd is essential for those decisions and the research is counted upon to play a major role.



Research team members, studying the decline of the caribou herd at Denali National Park and Preserve, from left: Mitch Taylor, Bob Pegau (hidden), Tom Bergerud, Ray Cameron, Frank Singer, Glen Ellison, Frank Miller, Al Franzmann, and James Davis.