

# The case of the disappearing moose

Part 2 of 3

**Editor's note:** In Part 1 (January ALASKA®, page 22) Alaska Department of Fish & Game biologist Warren Ballard reviewed the biological information available to state game managers in the Nelchina Basin of Interior Alaska where an important and once-thriving moose herd was in a serious state of decline. A study was started to pinpoint the cause. Sixty wolves were removed from one area. More than 100 cow moose were captured, marked with radio collars or numbered canvas collars, and biological information collected from them. The moose were healthy. Yet moose calves were not surviving the summer.

**T**o learn essential information about the wolves of the Nelchina Basin a fair number of them had to be captured.

This is winter work that depends upon new-fallen snow when wolves can be tracked from a small plane. Experienced pilots, such as Al Lee, Ken Bunch, and Cleo McMahan, all familiar with the region, and all high-time Alaskan pilots, worked for the department for this study. All of them can follow fresh wolf tracks right to the animals. Once the wolves were found, their location was radioed to a base station where a helicopter stood by.

The helicopter usually approaches wolves by flying in above the plane which has been circling them: if it comes straight in the wolves will scatter, and chances are good that all will escape. As the chopper drops, a wolf is selected and the

chase begins. It usually takes about five minutes to get a tranquilizer dart into a wolf from a helicopter. It's exciting and dangerous work, with the wolf dodging about in the snow and between the trees as the low-flying helicopter piloted by veteran Vern Lofstedt gradually gets closer and closer. The biologist with the dart gun works on the side where a door has been removed — cold work.

I'll never forget darting my first wolf. I was in the rear seat behind Lofstedt, and we were heading toward the Susitna River to collar moose when we spotted five wolves lying on a snow-covered lake. It was





a pack I had been unable to find. "You want to dart one?" Vern asked.

"You bet," I responded, and we were off.

As the chopper moved toward the wolves they started to scatter toward the trees. Vern picked out a medium-sized gray animal as it headed for the middle of the lake, and yelled, "Are you ready?"

I yanked down the canvas door; the 20 below zero air chilled the cabin instantly. Vern flew beside the wolf as I fired the dart, which seemed as if it moved in slow motion as it arced towards the wolf and struck it in the hip.

"Good shot," Vern yelled.

I've never had an easier one.

Once a dart is in a wolf, sedation takes about eight minutes, during which time the helicopter follows from a distance. At the same time the spotter plane keeps track of the rest of the pack. We tried to capture at least three members of each wolf pack.

Between 1975 and 1980 we captured more than 150 wolves in this manner, with only two wolves dying in the process. Captured wolves returned to their packs after sleeping off the effects of the drug: often they rejoined within 12 hours. We've recently used new drugs: once a wolf has been marked and is ready for release it is awakened with a second drug, and it quickly becomes alert and is commonly back with the pack within hours.

Each captured wolf was equipped with a radio-collar, which weighs slightly more than a pound, and the animal was ear-tagged so it could be identified even if it lost the radio-collar. Measurements were taken so the animals could be compared with wolves elsewhere. Hair and blood samples were collected and used to determine health of the animal, and to determine if disease is present. Information collected so far indicates that the Nelchina Basin wolves are healthy.

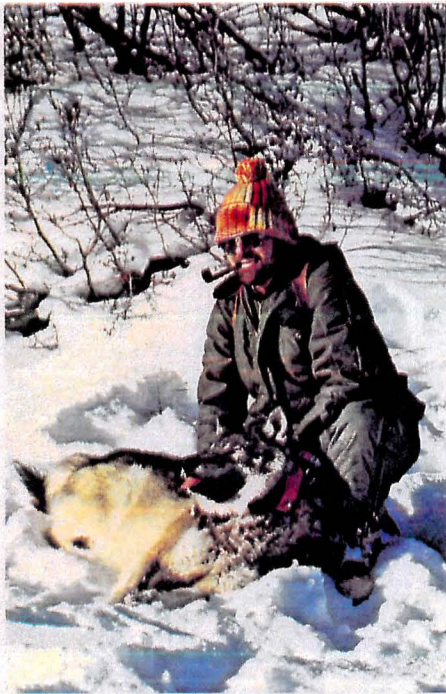
*Preliminary evidence indicated that the decline of the moose population of the Nelchina Basin was due to calf predation by wolves. (Martin W. Grosnick)*

During the years of this study I developed a great respect for wolves. Most have their own personality, and often I could identify individuals in a pack even without a radio-collar. We spent many hours in the air over various wolf packs and I think all of us had to be on guard to keep personal feelings for the animals from interfering with the design of the research program.

At various times during the study members of from 6 to 14 wolf packs carried radio-collars. Over a five-year period radio-collared wolves were located from airplanes on more than 4,000 occasions, resulting in almost 10,000 individual wolf sightings. The cumulative information began to show how these wolves live.

Wolf packs occupy and defend against other wolves and wolf packs,

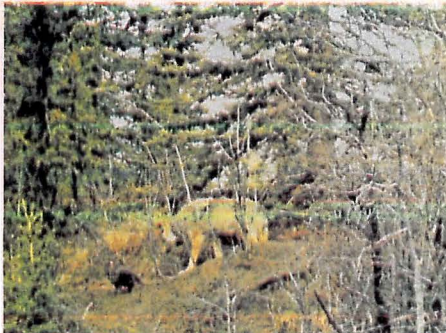




Author Ballard has just outfitted this wolf with a radio-collar. During a five-year period, 150 wolves were captured and equipped with these radio-collars for tracking purposes. (ADF&G)

their own territory, which contains all of the requisites needed by a pack. In the Nelchina Basin, wolf territories varied in size from 268 square miles to 864 square miles. They averaged 537 square miles. Packs which lived where there were the fewest moose and caribou had the largest territories; where moose and caribou were abundant, territories were smaller. Boundaries of individual wolf pack

*The den site is the focal point of a wolf pack's activities during May and June. This female keeps a close eye on a three- to four-week-old pup. (James Foster)*



territories change slightly from year to year, but during any given year they do not overlap into other territories.

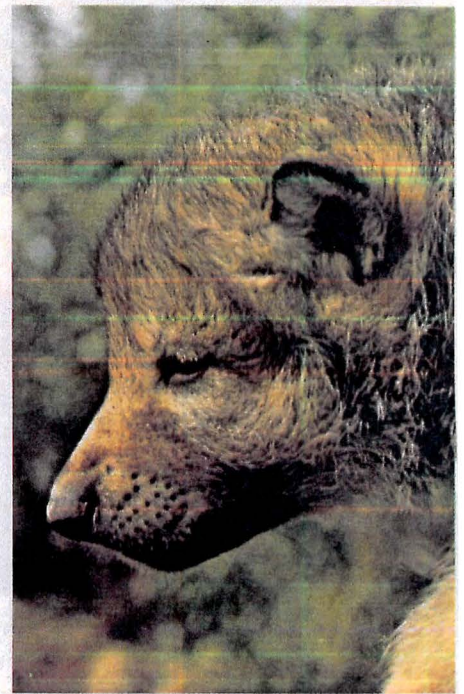
The number of wolves living in Game Management Unit 13 was estimated each year of the study, based upon the number of wolves known to be in each radio-collared pack. Numbers fluctuated widely from fall to spring each year because of losses from hunting, trapping, and dispersal. An estimated 390 wolves lived in GMU 13 (23,000 square miles) in the fall of 1975, but by spring 1976 there were about 270. Since then wolves have declined, with the lowest estimate made in the spring of 1979 at 136. By spring, 1980, they had increased slightly to 168.

Wolves have a great ability to reoccupy areas where they have been reduced by trapping, hunting, or disease — or to colonize new areas. Generally younger members of a pack (three years old or less) break away during late spring or summer and seek new territories or attempt to join existing packs. These dispersing wolves traveled an average of about 50 miles before forming or joining an existing pack. In one case, at least two, and perhaps as many as four, wolves from the Nelchina traveled 455 air miles to the eastern Brooks Range of arctic Alaska — a record known movement for wolves anywhere.

Nelchina wolves breed in late February through March, and by late April pregnant females begin choosing den sites. Use of den sites is fairly traditional, and dens may be used year after year for several years. Each pack has two or three preferred sites. Usually only one female in a pack reproduces each year, in May, bearing an average of six pups. During this study two of 28 denning packs maintained two den sites and produced young at each.

Most pups survive for a time, although not unlike young of other species, some wolf pups die of starvation, disease, and, in some cases, predation by bears. During denning season, May to mid-July, the den is the focal point of all wolf activities. While denning, wolves hunt fairly close to the den and use only about one-half to two-thirds of their territory.

By July wolves move their pups to the first of a series of sometimes



*Pups such as this three-week-old are totally dependent upon the pack members for care and food. Generally, six pups are produced by a pack in the Nelchina each year. Some pups die from accident, injury, or other factors. (Warren B. Ballard)*

two or three other sites — which we call rendezvous sites. These sites may be within half a mile, or may be several miles from, the original den. Although we don't know for sure why the movement occurs, it appears likely that it is related in part to food abundance, or perhaps the wolves simply desire to use a new area.

Wolves may remain at a rendezvous site from two to three weeks. By late August or early September pups begin to travel with the adults on hunting trips.

Over a five-year period, each August or September after the wolves had left, we visited 30 den and rendezvous sites to gather information on the characteristics of the dens, and, more importantly, to collect scats to learn the types and quantities of food eaten while these areas were being used.

Most of the dens were renovated fox dens, usually of several small holes and from one to four main holes with a diameter of 16 to 22 inches. All tunnels usually interconnected. Most sites had



southern exposure, and were in soft soils with good drainage. These factors presumably help to keep pups dry and warm. Usually not more than 10 feet from the entrance to one of the main holes was a whelping chamber where the tunnel widened up to four feet and allowed the female to lie down and comfortably care for pups.

Evidence of what wolves have eaten remains in their scats primarily in the form of hair, but also in pieces of bone. In 3,624 scats, calf moose was the most frequently identified food item (44%), followed by snowshoe hare (14.2%), beaver (10%), and adult moose (9.2%). Based upon these data alone one would conclude that calf moose were heavily preyed upon by wolves. However, this was not the case.

Wolf research in Minnesota by T. Floyd and David Mech has suggested that because of volume to size ratios, relatively small prey such as calf moose are proportionately covered with more hair and are thus over-represented in scat samples based solely on percentage of occurrence of food items. Because of this we converted the scat data to actual numbers of prey.

This type of analysis, in conjunction with the wolf population estimates for the Nelchina Basin, allowed us to estimate that from mid-May to mid-July of 1975-1979, wolves preyed annually upon approximately 270 to 1,013 moose calves and from 23 to 132 adult moose. Although this seems like a large number, it represented a small proportion of the prey available.

For example, an estimated 10,000 or more moose calves were produced each spring in the Nelchina. Therefore, the maximum kill of approximately 1,000 moose calves based upon scat collections represented only 10% or less of the moose being born. From the moose counts conducted each November it was fairly apparent that around 80% of the calves were dying. If the scat data were generally representative of what wolves were killing and eating, an additional 7,000 calves needed to be accounted for.

The estimated low number of calf moose killed by wolves was supported by aerial observations of radio-collared wolves.



*The author measures the canine teeth of an immobilized, radio-collared wolf. Such measurements assist biologists in determining the age of captured wolves. (Russ Dixon)*

From April 1975 through June 1980, radio-collared wolves were observed on 360 kills. On 38 of these, brown bears were also present. Interestingly, during the months May through November, when most calf mortality occurs, wolves were observed on 172 kills, of which only 21 moose were calves.

From these results it was apparent that predation by wolves on newborn moose calves was not as important as had been thought. Because the aerial observations of radio-collared wolves failed to explain the large calf moose losses, it became apparent that a different study approach was warranted. □

**Next month: moose calf mortality studies, the brown bear experiment, and yearling moose studies.**



*Note the ear tags on this tranquilized black wolf. Each captured wolf was ear-tagged so that even if it lost its collar it could still be identified. (Ken Taylor)*