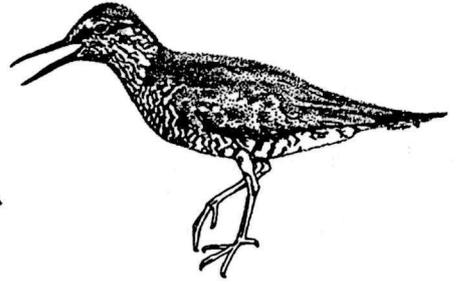


# THE TATTLER

The Science Newsletter for  
Denali National Park and Preserve



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## FINAL SCORE: PREDATORS 30, CARIBOU 11

It's been another grim calving season for the Denali Caribou Herd, as was expected following a short summer last year and a snowy winter. At first, it looked like the cows had pulled off a minor miracle when we determined that 76% were pregnant, comparable to the "glory years" of 1986-88. However, it was merely numerical "smoke and mirrors." A 76% pregnancy rate meant something quite different in 1986-88 than it does now. In the earlier years there were many yearling and two-year-old cows which normally are not pregnant; therefore the older cows were nearly all pregnant. This year there were very few yearlings and two-year-olds because of the poor calf survival the last two years, meaning that the older cows had lower reproduction. In our radio-collared sample we had no pregnant two-year-olds, only 30% of the three-year-olds were pregnant (the only pregnant ones wintered with the Nelchina Herd near balmy Cantwell!), and just half the four-year-olds had calves. In contrast, in the era of easy winters, nearly half the two-year-olds and almost all the cows three years old or older gave birth.

When the calves hit the ground, the going was tough. There were lots of wolves on the calving ground, more than ever before during the study, and they made quick work of the calves. The bears also got their fair share, and golden eagles and even a wolverine took a whack at them, too. By June 8th we had lost 30 of 41 radio-collared calves and the herd's calf:cow ratio was 22:100, almost as low as at the same time in 1991, following record winter snowfall.

On a more positive note, the wayward caribou that dispersed to the four winds this winter have returned. For those of you that were not around this winter, we had a mass exodus of caribou from the park in late September on the heels of a very heavy and unseasonal snowfall. Denali caribou mixed with the adjacent Delta Caribou Herd and ended up scattered

over much of the central Interior and as far away as Fairbanks, Eielson Air Force Base and Livengood. The record went to a cow and calf that wintered on the north side of the White Mountains, over 150 miles from the herd's normal winter range. A few caribou were still on the south side of the Alaska Range when the snows hit, and they wintered with the Nelchina Herd in the Cantwell area. As of mid-April, many of the caribou had returned to the Alaska Range, but several of the far-flung animals north of the Tanana River and those with the Nelchina Herd were still in the areas where they had wintered. As the calving season progressed these caribou continued to dribble back into the park, until only the White Mountains cow and calf, and a two-year-old west of Cantwell, were not accounted for. Around May 25th, the White Mountains cow with her calf in tow showed up west of Healy and made a beeline for the calving ground. The Cantwell two-year-old has not returned as of yet, but she can see "home" from her current location and may still make it back.

What does all this mean for the future of the Denali Caribou Herd? The herd now numbers around 2100 animals and has declined by 26% since this time last year and by over 44% since 1990 when the decline began. With continuing lower adult survival and four years of poor calf recruitment the trend for the next few years is bound to be down with winter snowfall determining the rate of the decline.

Layne Adams  
ARO Research Biologist

## SIXTY BELOW AT SLIPPERY SLOUGH?

Way out west, on a meandering distributary of the McKinley River called Slippery Slough, sits a silvery, spidery structure with a twenty-foot-high mast. Even farther west, another one is perched near Lake Minchumina. What are these things, and what are

they doing in such remote spots?

Although at first glance they may look like weird lunar landers, these contraptions are actually Remote Automated Weather Stations (RAWS). Each RAWS consists of instruments that gather hourly weather data—air and fuel temperature, relative humidity, precipitation, wind speed and wind direction. This information is automatically transmitted from each RAWS by satellite to the Boise Interagency Fire Center (BIFC) in Idaho, where it is downloaded to computer and sent to the Alaska Fire Service (AFS) in Fairbanks. From our office at Park Headquarters, we can dial AFS by computer modem and "watch the weather" at Slippery Slough and Lake Minchumina.

RAWS are maintained by the National Park Service as part of an inter-agency, nationwide network of over 750 stations, some forty of which are located in Alaska. They are used primarily by BIFC and AFS to determine wildfire weather conditions in remote locations, but they also provide useful weather information for people in a variety of other disciplines.

Because RAWS operate off of solar power and transmit data automatically, they normally require only a minimum of maintenance. Unfortunately, we encountered several problems at our McKinley River site last year. Early in the season, the rain gauge stopped working and had to be replaced after it got clogged with volcanic ash from the Mt. Spurr eruption. Later, the rain gauge was damaged again, this time when an animal knocked it over and squashed it. And finally, we lost transmissions completely when a bear tore all the cabling out of the data processing electronics box and chewed it thoroughly.

While we can't do anything about volcanic eruptions, we hope to avoid more bear problems this year by encircling the McKinley site with a simple, solar-powered electric fence. We've also replaced the tower there, and have put the rain gauge up high, out of the bears' reach.

Until now, Denali's RAWS have operated only during the summer months when there is plenty of sunlight to power the systems. This year we added another solar panel and an extra set of deep cycle marine batteries to each of our stations; we hope these auxiliary power supplies will allow us to keep the stations running year-round. In the dead of

winter, when the sun slips low over the cold southern horizon, will we catch RAWS messages transmitted through space: sixty below at Slippery Slough?

Paul Atkinson  
Physical Sciences Technician

## WHAT'S UP WITH THE BEARS

Like the other big mammals in Denali, things are not looking good for the bears this year. Of the six radio collared research sows that could have produced spring cubs, none did. In fact, we've had only one report so far of spring cubs in the Park and those were on the Toklat.

We recently completed a very intense five day bear research capture effort. During that time 17 bears were captured. Ten of those were to replace or refurbish old collars, while six were captured to attach new collars. One bear, an adult male who has established himself well outside the study area, had his collar removed.

The majority of bears collared as part of the research project spend their time from about the Muldrow Glacier west to the Herron River. Two five-year-old brothers, however, have gotten the urge to leave home. One has been hanging around the Teklanika River since last fall, while the other has moved north of Kantishna. Their movements will give us some insight into the dispersal patterns of young male bears.

Another interesting tidbit is that of the thirty research bears we radio-tracked up to this spring, two were found dead. Evidence indicates that both were probably killed by other bears. One was a five-year-old male, the other was a twenty-year-old female who had three yearlings with her last year. No sign of the cubs.

Pat Owen  
Biological Technician—Wildlife



## A PHYSICAL FRAMEWORK FOR ROCK CREEK

In 1992, the Denali Inventory and Monitoring Program began collecting data that address the physical, chemical and biological processes of the Rock Creek Watershed Ecosystem. These baseline data will provide information to indicate changes in the environment due to both natural and human-induced causes. The data will also be used to help guide management decisions and may help to measure the effectiveness of resource protection activities in the park and surrounding areas.

Every system has a framework, and the framework for the Rock Creek Ecosystem is the physical and chemical processes of the air, water, and soil which help to determine the plants and animals in the drainage. Starting in 1992 and continuing in 1993, the Rock Creek drainage has been "wired for sound." In other words, the drainage has been "wired" with a number of atmospheric, soils, and hydrologic monitoring stations which automatically gather hourly data regarding physical and chemical processes. The stations include two "regional" meteorological stations, four micro-meteorological/soils monitoring stations, and a stream height recording station.

The two regional meteorological stations record data pertaining to wind speed and direction, rainfall, barometric pressure, relative humidity and solar radiation. The four micro-climate/soils monitoring stations look at the same atmospheric information as the meteorological stations, but they gather information much lower to the ground, where effects from nearby vegetation play a key role. These stations are closely tied to vegetation, small mammals and bird monitoring sites in four habitat types: mature white spruce forest at 2600 feet, moss tussocks underlain by permafrost at 2600 feet, taiga forest at treeline at 3200 feet, and alpine tundra at 4600 feet.

The soils stations also gather data from below-ground sensors which look at soil temperatures, soil moisture content, and soil/organic matter gas emissions of methane and carbon dioxide. Each of these parameters is extremely sensitive to changes in the physical environment such as an increase in mean annual air temperature or increased precipitation. They will also closely reflect any changes in the vegetation community.

The Rock Creek stream gauging station records the level of the water in the creek. These data are used in conjunction with manual measurements of stream discharge to draw a hydrologic curve for Rock Creek. The hydrologic curve profiles how water flows in the creek throughout the time when the creek is ice-free and will reflect any changes in the water cycle of the drainage.

Some of the meteorology, soils and hydrology sensors are already in place and collecting data, while the rest should be installed by mid-summer. The meteorologic and hydrologic sensors are functional as soon as they are installed, while the soil sensors require a few months to stabilize. We expect to be collecting good data from all sensors by early 1994.

Greg Probst  
Physical Sciences Technician

## WEATHER AND MOOSE IN 1992-1993

Nineteen ninety-two was about as bad as it gets, weather-wise, for moose at Denali. It started with a late spring that featured snow as deep as three feet in mid-May at the eastern end of the park. Some calves were born in two feet of snow in late May, and shrubs didn't leaf out until later than normal, thereby delaying the time when cows can rely on forage, rather than body reserves, to produce milk for calves.

Three feet of snow in mid-September was unprecedented and started winter about a month early. Forage for moose was buried and the energy cost of moving through deep snow increased greatly, especially for calves that are much smaller than adults. The breeding season progressed normally despite the snow, but moose rutted in non-traditional areas.

Some moose paid the ultimate price during late winter as a result of the short growing season and high energy cost of moving about in deep snow. About one-third of the eighteen radio-collared moose died, the highest proportion recorded during the thirteen-year study. Some moose tried to winter in places they hadn't been before, including an adult bull that moved to the Nenana Canyon by Antler Creek, a windy, cold place without enough high-density willow stands to support many moose.

Despite severe winter conditions, many moose survived, probably because lack of snow in late winter, warm temperatures, and an early leaf-out combined to give them a real break. Had the spring of 1993 been as late as in 1992, the die-off of moose here probably would have mirrored 1989-90 in the lower Matanuska-Susitna basin when about forty percent of the population died.

So far this spring, we have observed the surviving cows to be in relatively poor condition. They are thin and bony with obvious ribs and hips—signs that fat stores are depleted and muscle tissue reduced. However, the calving season has progressed normally with about half the adult cows giving birth to twins. Leaf-out was about two weeks early and cows should therefore be able to recover some of the fat and protein lost during winter as well as provide milk to nourish this year's calves.

Hopefully, winter will arrive a little later this year and Denali's moose will have an easier time than last year. Unfortunately, the weather records suggest that bad winters (as well as mild ones) tend to occur in bunches, and we now seem to be in a cycle of tough winters.

Vic Van Ballenberghe  
US Forest Service Researcher

#### GLEN CREEK CAMP

Glen Creek Camp is a remote field camp located at the confluence of Glen Creek and Moose Creek, five miles upstream from Mile 89 of the Denali Park Road. Access is by helicopter or four-wheel drive vehicle.

The camp is a cooperative effort between the Alaska Regional Office and Denali Park. Regional operations support the Kantishna Mining Claims Acquisition Program. These include hazardous waste inventories, reclamation inventories, mineral and surface appraisals, mineral validity examinations, abandoned mine land surveys, and mining operations management.

Denali researchers Roseann Densmore and Ken Karle continue studies of placer mined streambeds. Roseann is developing revegetation techniques utilizing

native plants while Ken's work involves recontouring disturbed floodplains to more natural profiles.

The camp houses up to 35 people. Eight-by-ten wall tents and weatherports are used as quarters, larger weatherports serve as offices and work areas. A kitchen and dining area are housed in a 24 x 40 weatherport.

The camp has successfully used solar energy to power 12-volt pumps and battery chargers. Photovoltaics will continue to provide most of the camp's electrical needs.

Visits to Glen Creek Camp are encouraged. Please contact Jim Trumbull, the camp manager, in advance. Camp can be accessed by hiking or biking along the unimproved road that parallels Moose Creek. Visitors on volunteer status may be flown in if the helicopter work schedule allows; see Thea Nordling for volunteer information.

Jim Trumbull  
Camp Manager

#### NEOTROPICAL MIGRANT PASSERINES BEING STUDIED IN DENALI

The Alaska Bird Observatory and The Institute for Bird Populations have joined forces to monitor population trends of forest nesting birds in Denali National Park and Preserve. The research is being accomplished through two complimentary techniques: intense point count surveys, and constant effort mist netting and banding in conjunction with point count surveys.

This is the second year for the Monitoring Avian Productivity and Survivorship (MAPS) program. The program was very successful last year, with over one thousand birds banded at five separate stations. This year the banding and point counts are being conducted by Doug Faulkner and Julie Melton. They are quite excited since their banding efforts have already produced banded birds from last year with the most notable being two Swainson's Thrushes and a Wilson's Warbler wintering in northern South America and Mexico, respectively. Doug and Julie will be working until the end of August.

The Alaska Bird Observatory has recently engaged in a project to develop monitoring techniques to allow researchers to observe population trends of the major forest breeding birds in the park over time. Jeff Bouton and Todd Eskelin are conducting point count surveys throughout the forested areas in the park, as well as vegetation analysis of each point. They will be here through the end of June.

Anyone interested in these two projects is encouraged to drop by C-Camp and find these people. Their doors are always open.

Todd Eskelin  
Researcher, Alaska Bird Observatory

### PLANNING, PERMITS, AND POLITICS

It's inevitable. The arrival of a new administration in Washington, DC, means change in the federal government. Secretary of the Interior Bruce Babbitt has been quick to begin making changes with the announcement that a new agency—the National Biological Survey (NBS)—will be established shortly. The NBS will be charged with preparing an inventory of biological resources throughout the United States, preparing assessments on the condition of those resources, and developing a scientific pool which is free from land management agency politics and policy constraints. To get the new agency off the ground, Babbitt has canvassed the land management agencies and asked that they contribute funding and personnel to the cause. Most NPS scientists are headed to the NBS as are other major natural resources initiatives. Here at Denali, Jeff Keay (with funding) and the Long-Term Ecological Monitoring (LTEM) Program will move to the NBS. These two moves represent about one-third of the total research and resource preservation budget here in the park. We are hopeful that both Jeff and the LTEM will stay here with new supervisors in the NBS. It is unclear what the long-term implications will be for the NPS but we will provide periodic updates as changes are made.

Your local bureaucratic biologists have also been hard at work making changes. This spring we inaugurated a new research permit system which applies to all studies underway in the park. We are still hearing screams about more paperwork. So why

did we do this? First, we needed to get control of the research activities in the park. Right now there are about forty different projects underway. Each requires different levels of support and interaction by park staff members. The permit system allows us to set priorities amongst these projects and to assure that the Service is getting a return on our efforts. Second, the permits ultimately provide protection to park resources. We are now reviewing proposals to assure that they are compatible with park goals and objectives and we are able to stipulate exactly what activities a scientist may engage in while working in the park. We should end up with better resource protection, smoother park operations, and improved reporting of research results.

Finally, the "P" word—planning. The park's Resources Management Plan is taking a nap on my office floor while we get the field season underway. However, this past spring, Joe Van Horn and I were busy organizing and consolidating hundreds of ideas which were developed during scoping sessions. Those have been compiled into a four year program. Our next step will be serious writing of project statements (about eight of those are in some sort of draft form already). By late August the Division's staff members will probably be suffering from writers' cramp. Any offers for help with this effort will be gladly entertained.

Gordon Olson  
Chief, R&RP

### WOLF NEWS

Wolf biologists Tom Meier and John Burch will be around for only part of the summer, with Tom leaving for Minnesota in July (never to return?) and John returning to UAF in September. Cooperation with caribou and bear researchers allowed the gathering of about 250 wolf observations in May, mostly on the caribou calving grounds south and west of the McKinley River. Wolves along the park road corridor were also monitored to determine which dens were active this year, so the park might match backcountry closures to wolf use.

The author of Denali's backcountry closure system, Dr. Gordon Haber, was busy this spring. In addition to his usual demands that wolf rendezvous sites

unused for over twenty years be kept closed (while active dens go unprotected), he found time to file several Freedom of Information Act requests with the Park Service, including one asking for the radio frequencies of collared wolves in the park and another asking for a large body of raw data (some of it only one day old) from NPS biologists.

Dr. Haber has made similar requests to the Alaska Department of Fish and Game, and in fact won a court ruling that the agency must turn over its radio collar frequencies to him. Already, ADF&G has received several other requests for the frequencies, from tour companies, consulting firms, and sportsmen, who expect to be more efficient in their wildlife pursuits once this information is available.

The radio frequency issue is of great concern to biologists, because it jeopardizes the survival of their study animals and their future ability to do research. The data issue is of even more concern to them, because it jeopardizes the research they have already done. The release of preliminary data, before the researchers who gathered it have had a reasonable opportunity to compile and publish it, directly affects their job performance and job prospects.

Of course, I'd rather be out of a job than get shot from an airplane, so our greater concern should probably be for the wolves whose radio collar frequencies may soon be public knowledge. One solution would be to remove the collars (as Dr. Haber, before his recent conversion, had demanded we do). That would cost upwards of \$20,000, and would cut short one of the most comprehensive predator/prey studies ever undertaken. So our best hope is that this information will not need to be made public.

Tom Meier  
Wolf Biologist

#### ANCIENT GLACIERS ON THE RETREAT: WONDER LAKE, ALASKA

Dr. Alan Werner and graduate student Jon Child of Mount Holyoke College in South Hadley, Massachusetts, returned to Denali early this spring to continue research on the glacial history of the Wonder Lake area. Specifically, they are seeking to obtain a detailed record of climatic events that occurred

during the Late Wisconsin Period (10-20,000 years ago). The last glacial maximum, or the most recent time when the world's glaciers reached their greatest extent, occurred approximately 18,000 years before present time. Werner and Child are interested in what the Muldrow/Peters glacier complex looked like during this last glacial maximum, as well as what kind of climate, habitat, and depositional environment changes Wonder Lake experienced in the ensuing years as the glaciers retreated.

The key is found in the sediments left at the bottom of the lake during the glacial retreat. The sediment layers and their inter-relationships, ancient pollen types taken from the layers, and radiocarbon dates from inter-bedded organic matter will help to reveal the glacial history.

To closely examine these sediments, cores had to be removed from the lake bottom; because Wonder Lake is up to 300 feet deep, this was not an easy prospect. After a hole was augured through the 37" thick ice, a twenty-foot-long section of PVC was attached to a cable and sent to the bottom. A fifty-pound cylinder of steel, "the hammer," was attached to the cable and sent down next. At the surface, two members of the research team pulled ropes connected to the hammer via a pulley system. By repeatedly raising and dropping the hammer on the top of the PVC tube, the tube could be driven completely into the lake-bottom sediments. Finally, the tube, together with the core, was sucked out of the mud with a truck jack.

The researchers successfully removed thirteen cores in a three week effort. The cores were flown back to Massachusetts, where Werner and Child will analyze them and attempt to piece together a picture of Wonder Lake's past.

Greg Probst  
Physical Sciences Technician

#### SO LONG, TOM. . . .

Tom Meier, biologist with the wolf project, is leaving after almost seven years living and working in Denali. Tom will be making his way back to his home state of Minnesota where he will further his education by pursuing his doctoral degree. Good luck in your endeavors, Tom. We'll miss ya!