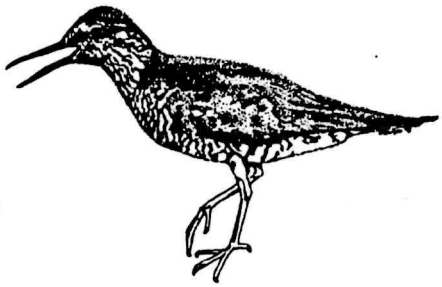
THE TATTLER



The Science Newsletter for
Denali National Park and Preserve

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SLUMP-EARTHFLOW RESEARCH GAINS SUPPORT

While controversy and outrage surround the recently discovered Radio-collaring rock "research" occurring at the Toklat River, scientists and environmentalists alike have been applauding the more sensitive techniques employed by the investigators of a mass movement, locally known as the Drunken Forest, in Denali National Park. Humanitarian awards are being considered for the study of the slump-earthflow, which has provided immeasurable data and knowledge about such phenomena with little impact, and at no cost to the character of the Denali wilderness.

Research techniques utilized, involve the time honored, non-destructive methods of survey and observation. "Standard topographic survey techniques have been used to monitor the movement, and seismic surveys were performed to get a feel for the subsurface character," explains Phil Brease, principal investigator. "Sophisticated technology can be used humanely to gain knowledge about such movements without affect to the natural environment, both around it and within it."

Once a year, since the fall of 1987, Brease and a small party of assistants scramble over the slump to measure the degree and direction of movement, obtain on-site weather data, and photodocument specific features. They are not armed with dart guns, drills, or radio collars, but instead they shoot only pictures and survey stations. "On occasion we actually get down in the mud and essentially massage the flows with our legs and feet," reports Jean Kuty, a survey assistant. "This gesture actually reduces stress in portions of the mass movement."

While some investigators are embroiled in the controversy of the place of active research in wilderness national parks, Brease enjoys the casual low profile of research that does not impact, and may indeed enhance the environment. "Rather than risk influence to our environment for the purposes of the advancement of science, we are one with it," reports Brease, "Moreover, everyone knows serious research is not fun." Phil Brease

ASSISTED REVEGETATION IN DENALI NATIONAL PARK AND PRESERVE HOW CAN WE SPEED UP MOTHER NATURE'S WAYS IN THE NORTH?

An intensive revegetation program has been developed under the leadership of the Park Ecologist, Roseann Densmore. Revegetation, the restoration of native plant communities, is needed in alpine and subalpine areas disturbed by construction, visitor impacts, and mining. Restoration of native tundra and subalpine vegetation is necessary for several reasons.

Visual quality is an important consideration because many disturbances are close to visitor facilities and/or are visible for long distances from the Park road corridor. Second, erosion control is needed for some areas. Also, restoration of native plant communities contributes to improved wildlife habitat.

Currently, there are three restoration projects in progress. Revegetation projects at Savage Cabin, Polychrome Rest Stop, and the Wonder Lake Campground and Day-Use Area highlight the importance and applicability of revegetation as a management tool for resource protection and preservation. All three projects have proven successful in restoring areas damaged by construction and/or visitor impacts, improving visual quality, and defining visitor use patterns to prevent further degradation of Park resources.

This season the revegetation crew will tackle its largest and most visible project to date - restoration of the land adjacent to the Park road from the park entrance to the railroad crossing at Mile 1.2. Other smaller areas along the Park road to the Savage River

Bridge will also be restored.

We are excited about this project and hope that you are too! You can help us by informing visitors of the objectives of our revegetation program, especially at Polychrome and Wonder Lake. For more information, feel free to contact myself or Roseann at Resource Management.

LET IT GROW!

Michael Pope

BEARS RESISTANT TO FOOD CONTAINERS

Resource management has increased the supply of Bear Resistant Food Containers (BRFCs) by 33% by adding 100 new containers purchased this winter to Denali's stock of approximately 200.

The containers, an integral part of the Bear Human Conflict Management Action Plan, have reduced bear incidents in the park by 92% since their introduction in 1982. Reduction of bear incidents not only increases visitor safety but also decreases the need for management actions toward bears.

The additional BRFCs will help eliminate shortages of containers at the backcountry desk incurred during high use periods. They will also allow resource management to replace many old and worn containers. Because the BRFCs break from stress or improper use, the containers have limited lifetimes and constantly need repair and replacing. The new BRFCs will also allow more backcountry units to be designated mandatory for use of containers.

The Denali Foundation, a nonprofit research and educational organization, in recognition of the importance of BRFCs to the bear management program at Denali, has donated $2000.00 for the purchase of additional containers. Each BRFC costs the park about $80.00. This contribution allows resource management to use park funds for other high priority bear management activities.

Patty Del Vecchio

BROWN + WHITE = RED

Near-record snow depths in winter 1990-91 have taken their toll on some of the park's wildlife. The last two winters have both been unusually severe, creating a cumulative weakening effect on caribou, moose and sheep. As ungulate populations have suffered, predators and scavengers have had good feeding.

While snow depths have been sufficient to limit the movements of moose (as evidenced by the severe browsing and aspen bark shaving to be seen around park headquarters), we haven't experienced the widespread winter mortality that was seen south of the Alaska Range in 1989-90 and around Fairbanks in 1990-91. Snow conditions have probably been particularly hard on moose calves, which are less able to get around in the yard-deep snow that was seen over much of the park. Moose in some areas may actually have benefitted, as wolves concentrated on the even more vulnerable caribou.

Biologists monitoring wolf packs have found several sets of multiple caribou kills, mostly in the forested western part of the park. Last winter, 13 dead caribou were found in a two-square-mile area near the lower McKinley River. Wolves continued to feed on the frozen carcasses for weeks afterward. When wolves have made kills that they did not return to eat, foxes, wolverines, ravens, and awakening bears have completed the job. Abundant prey supplies have allowed the park's wolf population to increase to an estimated 194 wolves by Fall 1990.

In each of the last two winters mortality among radio-collared caribou was twice as high as it had been previously. Caribou calving in the spring of 1990 was late, and survival of calves was lower than normal throughout the summer. Regional biologist Layne Adams, assisted by other ARO and DENA biologists, will again be collaring young calves this May and monitoring their survival. About 35 or 40 calves, the offspring of radio-collared cows, will be captured. Capture efforts using a helicopter should end by the beginning of June. For the remainder of the summer the collared calves, along with collared bears and wolves, will be monitored about twice a month with fixed-wing aircraft.

Wolf biologists Tom Meier and John Burch are once again asking for reports of kill sites in and around the park. We are especially interested in remains of moose, caribou and sheep that died within the last year. A brief description of what you saw and a map of how to get there will send us happily digging through the hair and maggots.

Tom Meier

GLEN CREEK, THE CAMP

The Glen Creek Camp is a remote field camp established to support the Kantishna Mining Claim Acquisition and Reclamation Program being

conducted in the historic Kantishna Mining District of Denali National Park and Preserve. The camp is located on and around an abandoned air strip adjacent to an abandoned mining claim.

The camp is designed to accommodate up to 35 people for field operations in seven primary program areas: hazardous waste inventories, reclamation research and inventory, mineral and surface appraisals, mining validity investigations, abandoned mine land surveys, land surveying and FIREPRO. Except for abandoned mine lands and FIREPRO work, these programs are implementing the Service's decision to purchase private mining interests in the Kantishna area as outlined by the recently completed DENA Final Environmental Impact Statement on the Cumulative Impacts of Mining. In addition to the above mentioned programs, the camp will support mining plan monitoring, data collection and other surface evaluations as NPS minerals management program demand warrants.

The camp operates under the direct supervision of the Assistant Superintendent of the Park in coordination with the Mining and Minerals Division and the Land Resource Division of the Alaska Regional Office.

The camp has a support staff of seven and operates two staggered 10 and 4 day shifts. Each shift accommodates 10 to 16 field operations personnel. The Camp Manager supervises all activities associated with the camp. A Helicopter Manager supervises the aerial operations conducted out of the camp. A Delta 3 off-road transporter provides ground support between the camp and Kantishna while a Bell Jet Ranger provides aerial support for field operations. The FIREPRO crew and helicopter will also operate out of the camp

Roseann Densmore

CLEARING THE AIR

Did you know that at Denali we monitor air quality? Denali has an air quality monitoring station located just north of the headquarters area. Currently the station is equipped with a continuous ozone monitoring system, a filter system to monitor sulfur dioxide and particulates, a deposition bucket (mainly for acid precipitation) and meteorological instruments to measure precipitation, wind speed and direction, temperature and dew point, and solar radiation. There is also a visibility camera maintained through the summer months designed to monitor a vista of Mt. McKinley across Wonder Lake.

Though we don't have pollution problems on the scale of parks such as Grand Canyon or Sequoia-Kings Canyon, the potential is there. The proposed Healy Clean Coal Project will demonstrate a new coal fired power plant system which will purportedly easily meet the Clean Air Act New Source Performance Standards for emissions while using any of a broad range of coals. This 50 megawatt power plant is proposed for construction in April 1993 near the existing 25 megawatt Golden Valley Electric Association Healy Unit #1. In November 1990, an interagency (NPS, USGS, and Alaska Industrial Development and Export Authority) research plan was finalized that will provide data to estimate the potential impacts of the proposed project. The wilderness portion of Denali National Park is designated a Class I air shed. This means that only a "very small increment" of additional air quality degradation is allowed. Studies have been implemented to evaluate whether air pollutants emitted from the plant would impact any of the biological resources found in Denali. Two air quality monitoring stations outside the Park are collecting data on sulfur dioxide and nitrogen oxides. Computer modelling is also being done to determine the impact of plume visibility from the plant's stack.

Studies are also evaluating the susceptibility of the Park's vascular and non-vascular plant species and communities to these pollutants. In October, 1990, mosses and lichens were collected along two transects by Denali resource management personnel for later chemical analysis by USGS. Early season snowfall terminated this sampling effort prematurely. This may preclude obtaining desirable information for the draft Environmental Impact Statement due in July 1991, but should allow for incorporation of the data into the Prevention of Significant Deterioration Permit (October, 1991) or the final EIS (April, 1992). Moss and lichen samples collected in the fall were sent to USGS in January for analysis. All the plots on the two transects will be revisited this summer to provide a complete set of samples for analysis.

Pat Owen

CAN WE PUT HUMPTY-DUMPTY TOGETHER AGAIN?

Approximately 30 miles of stream and adjoining

riparian habitat in the Kantishna area was disturbed by placer gold mining from the early 1900's to 1985, when environmental groups halted it with a lawsuit. The resulting environmental impact statement recommended buying out the mine claim owners and restoring the mined areas.

Restoration is needed because placer mining not only disturbs the vegetation and stream critters, but damages the physical structure of the stream and the floodplain. Placer mining in the areas we are talking about involves: 1) bulldozing off the vegetation and soil, 2) excavating and processing the gravel from the streambed and floodplain, which removes soil from the gravel, and 3) dumping the processed gravel in piles, often on top of the soil which was pushed off the site.

We have an interdisciplinary, long-term research program to provide the information we need to develop and conduct this massive restoration program. The research program has a team of scientists from DENA, ARO, USGS, and the University of Alaska. Roseann Densmore is restoring the floodplain and streambanks. Ken Karle is heading up the stream restoration.

This brings us to the Humpty-Dumpty question. Restoration implies a return to the original. Can scrambled eggs be put back together again? Probably not. Can we facilitate recovery to a stable, productive alternative ecosystem? Probably.

The next questions are, "What sites will recover naturally, and what sites are still going to be a mess in 50 years?" and "What can we do to speed up recovery?" Our research is designed to answer these questions, because much of the existing methodogy for mine and stream reclamation is not applicable to northern latitudes or for a national park.

Our primary study area is the severely disturbed Glen Creek watershed in the Kantishna mining area in Denali National Park. Restoration started in 1988, when junk was hauled out and tailing piles were recontoured. Terrestrial research, emphasizing revegetation, started in 1989.

One of the main experiments has plots on 16 different types of regraded tailings, ranging from good sites with topsoil spread on them, to bad sites where the "soil" is just rock and sand. These sites have plots where natural revegetation is being monitored, and plots which have been planted with alder seedlings (which fix nitrogen), and willow and poplar cuttings. The results will show which types of sites revegetate naturally, and what planting methods will work best on sites where natural revegetation is very slow. So far, the good sites are coming back naturally, while the worst sites have little or no natural revegetation. The planted alders, however, are growing vigorously on even the worst sites, and are up to 3 and 4 feet tall, which is phenomenal growth for a subarctic treeline site.

Roseann Densmore

STREAM OF CONCIENCIOUSNESS

Glen Creek is typical of many placer-mined streams in the Kantishna area. It is characterized by significant stream channel adjustment and poor riparian zone vegetation. Unstable or excessively confined streambeds, as well as over-steep floodplains are evident along many reaches of the six mile length. Mining tailings have replaced much of the native streambed material. As a result, Glen Creek has not established a proper flow capacity, floodplain function, or natural slope and pattern. Additionally, populations of many of the macro and microinvertebrates, as well as slimy sculpin and grayling, have been severely impacted.

Understanding the interrelationships between riparian systems and the hydrologic and geomorphic processes at work in those systems is crucial to developing a reclamation scheme for disturbed stream channels. Riparian zones may be considered to act as floodplains,and function to dissipate stream energies associated with high flows. In return, sediments are deposited in the floodplain, which permits the continued development of the alluvial valley floor. Therefore, the hydrologic and geomorphic components of a riparian zone not only determine such features as pools, riffles, bed material, and streambank formation, but also deterine the basic biological habitat characteristics.

Where do we begin in repairing a damaged stream channel and floodplain? By comparing Glen Creek to other creeks in Kantishna and Interior Alaska, we can predict the size of the annual floods which carry the sediments needed for floodplain/vegetation development. By using hydraulic equations, we can design the shape of the channel and floodplain to help facilitate the deposition of the sediments, as occurs in an undisturbed stream. And by instituting a rigorous monitoring program, we can tell how our experiments, as well as natural processes, are encouraging a riparian restoration.

Ken Karle