Denali National Park and Preserve

1993 STATE OF PARK RESOURCES REPORT

RESOURCE CONDITIONS

Long-Term Ecological Monitoring

Ecological monitoring and protocol development continued in the Rock Creek watershed of the park for the second year. Significant strides were made in correcting problems from the previous year with meteorological equipment and in expanding the program into the soils arena. Four microclimate study sites were instrumented to begin tracking soil conditions. Mapping and marking of all study sites was completed. Investigations aimed at protocol development continued with avian and small mammal species. Operational elements of the program, including hydrology and water chemistry, air quality, vegetation, meteorology, glaciology, and avian mist netting continued largely without interruption.

Although this program is scheduled to shift to the National Biological Survey in 1994, additional growth is predicted.

Sheep Census Produces Interesting Results

Ground and aerial trend counts for Dall sheep were conducted again in 1993 during the standard period early in July. Additional aerial counts were made in early and mid June this year. The objective of the additional counts was to document that the low lamb numbers observed this year were the result of a poor birth rate and not a function of mortality between the late May and early June lambing period and the standard July counting period.

On June 2, no lambs were seen during aerial counts of 57 "ewe like" animals (yearlings and two year old rams are lumped with ewes). On June 15, only 10 lambs were seen from the air in a count of 192 "ewe like" animals. The results of the early July counts were similar. The ground count showed 6 lambs/100 ewes and 7 yearlings/100 ewes. This is the lowest count of either lambs or yearlings since 1974 when the yearly ground trend counts were initiated. Aerial counts in July showed 6 lambs/100 "ewe like" animals.

The Denali results are consistent with Alaska Department of Fish and Game surveys in other portions of the Alaska Range during these time periods in 1993.

The highest lamb/100 ewe count was in 1987 with 77 lambs and the mean since 1974 has been 46 lambs/100 ewes.

Moderately Active Wildfire Season

During 1993, nine wildfires burned in Denali National Park and Preserve. Ignitions started on June 4 and ended on July 28. The largest fire, known as Moose Creek 1, burned approximately 10,200 acres. The Birch Creek fire, the smallest fire of the season burned about 10 acres. The total acreage burned during the year was 23,225 acres.

Park Bears are Old

Research indicates that Denali supports a very old-age-structured population of grizzly bears, with an average adult female age of 17. This perhaps indicates a lack of recruitment of breeding females to the population for the past 10 years. Significant changes in sex and age structure and density are expected to occur within the next 5 years. The cause appears to be extremely high cub mortality with 65% of cubs-of-the-year and 40% of yearlings disappearing within the first 4 weeks following den emergence. Cub and yearling

mortality appear to be the principal factors driving grizzly bear population dynamics in Denali. The cause of mortality is unknown. The current status of the grizzly bear population must be determined in order to effectively develop survey and long-term monitoring techniques. Procedures for measuring visibility bias in aerial counts of bears have been established.

Moose Surveys

An aerial moose survey was conducted on November 19th and 20th, 1992, of the Windy Creek, Cantwell Creek, Bull River, and West Fork of the Chulitna drainages. Survey areas extended from the headwaters of these drainages in Denali National Park eastward to the Parks Highway in Broad Pass. Survey conditions were excellent with widespread snow cover, clear skies, and calm winds. The survey was conducted and data analyzed using Gasaway methods. The total survey area encompassed 214.7 square miles and was divided into 18 survey units.

An overall estimate of 317 moose was obtained for the survey area, representing an average of 1.32 moose per square mile. The overall age ratio was 27.8 calves/100 cows and the overall sex ratio was 29.4 bulls/100 cows.

Higher than expected moose numbers were observed in the Windy Creek (117) and Cantwell Creek (131) drainages. These two drainages accounted for 248 of the 283 moose actually observed during the survey. The concentration of moose in these two drainages is believed to be the result of snow conditions which influenced moose movements in the Broad Pass region. Snow depths in the southern portion of Broad Pass were observed to be in excess of 3 feet. Snow depths in the Cantwell and Windy Creek areas (northern portion of Broad Pass region) were significantly less due to strong winds associated with the southern entrance to Windy Pass.

Geology

A National Park Service investigation to determine the age and structural relationships of a small granitic pluton and the surrounding sedimentary rock was started during the summer of 1993. Located near the headwaters of Riley Creek, the pluton intrudes the Cantwell Formation, a collection of freshwater sandstones, conglomerates and shales.

The pluton had been radiometrically dated at 71.9 million years old (mya) in a previous reconnaissance investigation. The oldest age established for the Cantwell Formation, based on plant fossils, is Paleocene, or 50-60 mya. The current investigation will attempt to resolve the age discrepancy of having a younger rock intruded by an older rock. Samples were taken this summer for additional age dating analysis. This effort could result in proving the Cantwell Formation to be Cretaceous or older (71+ mya). If the formation dates to the Cretaceous period, it could contribute to research efforts aimed at explaining the worldwide extinction of numerous species which is believed to have occurred at the boundary between the Cretaceous and Tertiary periods.

Geologic Mapping

Staff from Denali National Park and the U.S. Geological Survey are working jointly in an effort to update an obsolete geologic map which encompasses roughly one third of the park and preserve. This effort was initiated during 1993 with investigations occurring in the Anderson Pass area, the Upper Toklat area and the Kantishna Hills. In several cases, geologists working on the project have determined that numerous discrepancies exist between what the original geologic map depicts for certain areas and what actually exists on the ground in those areas. One study bonus has been the discovery of marine fossils, known as Conodonts, in the limestones of the Totatlanika Schist. These fossils are thought to be 200 million years old.

RESOURCE STEWARDSHIP ACTIVITIES

Mined Land Reclamation

Two major projects were completed during the year in an effort to further progress with reclamation of previously mined lands. Park and Regional Office staff engaged in a clean-up of old structures and abandoned debris and equipment within the Eureka Creek drainage and selected other locations in the Kantishna mining district. This generated 75,000 pounds of material which was removed from the park. Park and Regional Office staff also removed 300 barrels, 44 smaller containers, and 55 lead acid batteries. 1977 gallons of waste fluids were also removed .

Bear-Human Interactions

1993 saw 173 documented bear-human interactions. Of these 73 were in the frontcounty and 100 occurred in the backcountry. No human injuries occurred but five incidents of bears obtaining unnatural food did occur and eight control actions were taken.

The most significant incident of the year involved a young male grizzly which was captured after five days of aversive conditioning in the Kantishna area. The bear was relocated twice to remote locations in the western part of the park only to return to Kantishna. The bear continued to demonstrate little fear of humans and continued interest in seeking unnatural food sources. The animal was captured a third time and given to the Grizzly Discovery Center in West Yellowstone, Montana.

1993 also marked the first year that Bear Resistant Food Container use was required in all backcountry units except Units 22 and 23. Sufficient numbers of food containers were finally purchased in 1992 to support this requirement.

Bear management staff also conducted training for national and state park staff in the south district. This was a particularly fruitful initiative as new information concerning wildlife issues was brought to light and the influence of the bear management program was finally extended to include the entire park.

Healy Clean Coal Project

The National Park Service review of the Healy Clean Coal Project continued throughout the year. During the winter months, Service staff reviewed and commented on the proposed Air Quality Control Permit which the State of Alaska was in the process of preparing. Concurrently the Service submitted comments on the Draft Environmental Impact Statement which the Department of Energy was preparing on the project. In February, the Department of the Interior issued a finding of adverse impact on Denali's air quality related values. In March, the State of Alaska issued its permit. Shortly thereafter, the National Park Service entered into an appeal process over that permit. Summer months were spent preparing for appeal hearings and in negotiations with the Department of Energy over the content of the Environmental Impact Statement.

Hazard Fuels Assessment Begins

Recently a great deal of attention has been directed at hazardous wildfire situations where urban development has occurred in densely vegetated relatively remote locations, thus placing those structures and personal property at high risk. The original intent of this project was to examine interface conditions around cabins in the backcountry of the park. At the direction of the Superintendent, the development located in the frontcountry of Denali, presenting situations similar to those recognized in California and other states, was given primary emphasis.

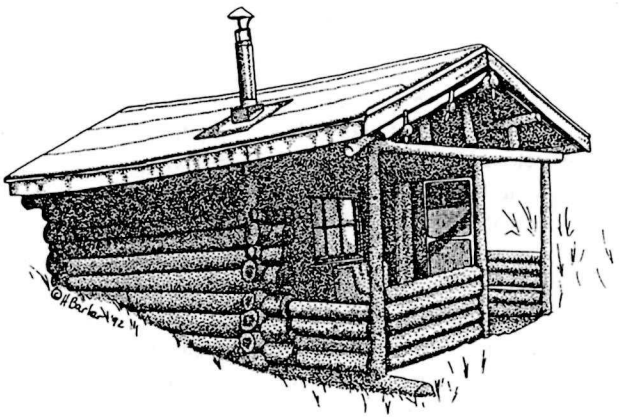
Before the Service can take action to correct this situation an assessment of current conditions must be completed. Late in the summer of 1993 a handful of park staff members began that assessment. Information about vegetation types, quanitities, and proximity to park structures was gathered. During the 1993-1994 winter we anticipate completing additional assessment work, examining potential hazard reduction strategies, and developing proposals to reduce those hazards. This is a particularly complex project because it involves multiple disciplines including wildfire ecology and suppression, structural fire protection, cultural resource

management, hazardous materials management, and development planning.

Park staff will invite numerous experts to provide advice on the project and hope to develop an interagency approach to dealing with the problem. Perhaps this will become a model for other agencies and land managers in Alaska.

Global Climate Change

In 1991, a glacier monitoring program was established by the National Park Service and the U.S. Geological Survey to identify change resulting from climate or geologic conditions. Two major glaciers, the Tralieka-Muldrow on the north side of the Alaska Range, and the Kahiltna on the south side, were selected for inclusion in the program. Index stations (stakes) have been placed in the glaciers at strategic locations to monitor the snow and ice balance and the flow rate of the glaciers. The stations have been surveyed twice yearly including 1993. The flow rate of the Kahiltna glacier is .59 meters per day (23.5 inches per day). The flow rate of the Tralieka glacier has not yet been determined. Annual surveying will continue in the future and the Service is hoping to install remote automatic weather stations on the two glaciers.



Cabin Restorations Continue

A multi-year cabin and historic structure restoration project was initiated in 1992. Major restoration work was completed on the Sushana Patrol Cabin during the summer of 1993. Work included raising the cabin, replacement of bottom logs and foundation timbers, floor replacement, roof rehabilitation, and several other minor repairs. Exterior chinking was also done on the Upper and Lower Savage Cabins and vegetation was removed from around the Lower Savage Cabin. Restoration is anticipated on the kennels during 1994.

Park Headquarters Historic District Preservation

Regional Office staff are now in the final phases of preparation of a preservation guide which gives specific guidance on how the historic structures at park headquarters are to be maintained. Many of these structures have been altered in subtle ways through years of use. The goal of the guide is to identify steps which park staff can take to restore the structures to original exterior conditions and to identify the appropriate materials and techniques which need to be employed during routine building maintenance. Some site restoration recommendations will also be made.

Limited restoration work was completed in the headquarters district on the Ranger Cache and two cabins.

Large Research Program Supported

The park continued to sponsor an extremely active research program. Denali National Park and Preserve has been designated as a Biosphere Reserve and therefore has an obligation to support a natural and social science program. In addition, the National Park Service supports research in an effort to identify solutions to resource related problems and to improve our understanding of park ecosystems.

Park Service scientists continued investigations focused on grizzly bears, caribou, wolves, revegetation, golden eagles, merlins, mined land reclamation, and various geologic topics. Cooperating scientists studied wolves, moose, fungi, mosquitos, stoneflies, fisheries, glaciology, seismotology, sedimentology, and so forth.

Of particular note was the initiation of a subsistence use investigation. This is the first significant study of this type undertaken by the park. The University of Washington under contract with the National Park Service is investigating customary and traditional use of traplines within the park.

ADMINISTRATIVE PROGRESS

Division Reorganization Completed

The Division of Research and Resource Preservation completed it's reorganization during 1993. The Division includes three primary Branches. These are a Branch of Wildlife and Vegetation, a Branch of Water, Air, Geology, and Soils, and a Branch of Subsistence Use and Cultural Resources. The Division also has on staff a Compliance Officer and an Inventory & Monitoring and Research Coordinator. Eventually the Division will grow with the addition of an Information Resources Branch which will be responsible for geographic information system operations, data management, and technical support services.

National Biological Survey Field Station Established

During 1993, the Secretary of the Interior announced the establishment of the National Biological Survey. This new bureau is intended to be a central clearinghouse for biological research conducted within the Department of the Interior and combines the forces of the National Park Service, the Fish and Wildlife Service, the Minerals Management Service, and other bureau scientists. All scientists within the National Park Service have been transferred to this new agency. Dr. Jeff Keay, the park's Research Wildlife Biologist, has moved over to the new agency but will remain stationed here at Denali. He will serve as the unit leader for the Denali Field Station that NBS will maintain. He will continue with his current investigations into the grizzly bear population of the park. It is anticipated that the park will enter into an agreement with NBS to govern the relationship between the two agencies.

Resources Management Planning

During the spring, park staff updated the resources management planning database and laid the foundation for continued revisions and updates to the park's Resources Management Plan. Staff also continued writing individual project statements. Those which are nearing completion include air quality, wolf management, bear management, water resources management, and road use impacts to natural resources. Numerous others are in draft form.

Research Permits Now Required

In an effort to provide more consistent support to park researchers and to improve communications between park staff and the scientific community, the park now requires that a Research Permit be issued to all scientists engaged in studies in the park. Permit processing allows park staff to review projects to assure that no adverse impacts to park resources are occurring and develops a binding relationship between the park and the investigator.

In addition, park staff is in the process of developing a computer database which will be used to track the status of all investigations which are ongoing. Use of this database will help assure compliance with requirements placed on scientists and will facilitate response to inquiries about current studies.

Financial Support

Funding to support research and resource preservation activities at Denali came from a variety of sources during 1993. Following is a brief summary of that support:

Resource Preservation	$451,806.00
Long-Term Monitoring	$275,000.00
Park Research	$208,404.00
	$935,210.00
Regional Research	$202,442.00
Other Sources	$ 62,150.00
	$264,592.00

For Further Information:

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