Final Report
Denali NPP Wolf Research Review Panel
May 22, 2002

Background

Scientific studies of wolves and their prey have been conducted in Denali National Park and Preserve for over 60 years, starting with the work of Adolph Murie described in his classic monograph, *The Wolves of Mount McKinley*, in 1944. Since 1986, research on wolves and their prey has been continuous and has depended largely on aerial radiotracking. This project, begun by David Mech, Layne Adams, Thomas Meier, John Burch, and Bruce Dale, has continued to the present time and has generated a wealth of information on the population dynamics of wolves, caribou, and moose. Layne Adams currently serves as the principal investigator for wolf research and monitoring in the park.

The standard radiotelemetry techniques used to monitor wolves in Denali provide population estimates, as well as information on physical condition, distribution, productivity, survival, dispersal, diseases, and genetic relationships. Radiotelemetry is also an important tool in caribou research and monitoring. The primary objectives of both the wolf and caribou research have been to annually assess the status and trend of these two species and to evaluate their interactions in a protected subarctic ecosystem. Since 1998, moose have also been included as a part of the predator-prey research at Denali.

Although the scientific value of wolf research in Denali has been substantial, there has been some concern about the use of radiotelemetry to collect data. Radiotelemetry requires that wolves be captured and handled, that they be fitted with radiocollars, and that they be followed with aircraft. While recognizing the benefits of radiotracking, there has been a desire on the part of park staff to minimize the intrusiveness of scientific methods used to gather information about animal populations. As a result, a review panel was formed to address questions concerning the information required to effectively manage wolves in Denali NPP, the value of wolf research and monitoring, and whether other and less intrusive methods than radiotelemetry are available to gather the same information.

The members of the review panel were Mr. Craig Axtell, Chief, Biological Resources Management Division, NPS, Dr. Gerry Wright, Idaho Cooperative Fish and Wildlife Research Unit, Mr. Patrick Valkenburg, Research Coordinator, Interior Regional Office, Alaska Department of Fish & Game, Dr. John Vucetich, Research Assistant Professor, Michigan Technological University, and Dr. Kirk Lohman, Alaska Regional Science Advisor, NPS. The review panel was specially asked to address the following questions:

1. What level of monitoring is necessary to effectively manage wolves and their prey in Denali? What level of wolf research is appropriate to maintain in the park?

2. Could park management effectively manage for natural and healthy populations with less intrusive methods than those currently being used? What methods are currently available to monitor wolf populations? What types of information can be acquired with different methods and what are the limitations of different approaches?

The review panel met at Denali NPP on April 9-10 and during that time met with and discussed wolf studies in Denali with Paul Anderson, Superintendent, Diane Chung, Deputy Superintendent, Susan Boudreau, Acting Chief of Resources, Hollis Twitchell, Chief of Subsistence and Cultural Resources, Pat Owen, Wildlife Biologist, Kahlil Wilson, Wildlife Biologist, Lucy Tyrrell, Research Administrator, Jane Bryant, Cultural Resource Technician, and Layne Adams, Research Wildlife Biologist, USGS-BRD Alaska Science Center.

Findings and Recommendations

As a consequence of the high quality and quantity of data already collected on wolves and their prey, effective management of wolf populations in Denali NPP requires relatively little data from a biological standpoint at the present time. No threats to the Denali wolf population are currently perceived. Human harvest has been light and dramatic increases in harvest seem unlikely in the near future. The detailed demographic information that results from radiocollaring of wolves is probably not critical from a strictly management perspective. What is needed is continued monitoring of harvest mortality which can be gathered without the use of radiotelemetry. There is a need for continued close cooperation with the Alaska Department of Fish and Game to ensure that the level of harvest is known and should significant changes in harvest occur, that appropriate management actions could be taken. If managing for natural regulation were the only justification, we would conclude that there is no compelling reason at the present time to continue radiocollaring wolves in Denali NPP.

We note that in conducting the research, Layne Adams has cooperated closely with the Alaska Department of Fish and Game. Data collected on wolf and caribou populations has been extremely valuable to the Department in setting harvest levels and in understanding population dynamics in other game management units. Consistent with the findings above, however, the Department does not regard the continuation of radiocollaring of wolves in Denali NPP as critical to its management actions so long as other means are available to determine harvest levels (e.g., the sealing requirement).

There are very strong reasons to continue the current radiotelemetry research and monitoring program, however, which go beyond the achievement of management objectives. In addition to the solid base it has provided for management decisions in the past, the wolf-prey research conducted by Layne Adams and others over the last 16 years

has been a unique and extremely valuable contribution to a basic understanding of the population dynamics of wolves and their prey. This work contributes enormously to the mission of the National Park Service. The National Parks Omnibus Management Act of 1998 mandates not only that management be enhanced by the availability of the highest quality science, but also that research of broader scientific value be encouraged wherever possible. We believe that the program, if continued as it has been conducted, would further add to our knowledge of predator-prey relations, that it would continue to stand out as one of the highest quality research and monitoring efforts in Denali NPP and in the National Park Service, and that its value would continue to extend far beyond park boundaries.

We believe it is important to emphasize the unique aspects of the wolf research and monitoring that has been conducted in Denali NPP. First, this work has focused on a wolf population and a predator-prey system that is largely unaffected by human harvest and can be described as one of the few naturally functioning wolf/prey systems in the world. The research is also unique in its duration, having provided in-depth demographic information on wolves and caribou for 16 years. The Denali study is the second longest comprehensive study of wolves and their prey in the world. Finally, the quality and the thoroughness of the work that has been conducted on wolves in Denali NPP has rarely been matched in other studies and locations. For 16 years, this work has generated detailed demographic information about wolves in Denali that has gone far beyond an annual census. This has included not only population estimates, but also estimates of the number of packs, pack size, pack home ranges, net pup recruitment, natural and harvest mortality, dispersal, physical condition, and disease prevalence. We would also note that the wolf research and monitoring program was reviewed in 1998 at the request of USGS-BRD. An outside group of wolf researchers (Dr. Steven Fritts, Dr. Jim Peek, Dr. Michael Phillips, and Dr. Ken Whitten) strongly endorsed the research and concluded that the program met professional standards, produced scientifically valid results, and provided the park with the information necessary to effectively manage wolf populations.

The detailed level of demographic information generated over the last 16 years could not have been obtained without the use of radiotelemetry. There is currently no technological alternative to radiotelemetry that can provide the same level of information about population characteristics and demographics. New techniques that have been suggested in recent years as less intrusive alternatives to radiocollaring include using DNA analysis of hair and scat samples. These techniques can be used to detect the presence of a species in an area or to generate a minimum population estimate, but have severe limitations as a means of accurately estimating population size. Nor can DNA techniques provide the data generated by radiotelemetry relative to mortality rates and causes, home range estimation, dispersal, recruitment, and behavior. In addition, the field effort necessary to collect hair or scat samples in a place like Denali NPP would be a challenging task at best. Although these methods would be less intrusive to wolves, such an effort would require considerable flight time and could mean a greater intrusion to other aspects of the Denali wilderness.

Although there are no good alternatives to radiotelemetry at the present time, we would recommend that Denali NPP revisit the question in 5 years. There may be significant advances in genetic techniques that might make DNA analysis a more plausible alternative to radiotelemetry. There may also be improvements in radiotelemetry and remote sensing technology that may result in less intrusive methods than those currently being used. Although we believe that reasonable alternatives to radiotelemetry are unlikely to arise within the next five years, we do encourage Denali NPP and the NPS to prod the scientific community in the development of less intrusive methods and techniques.

Should Denali NPP decide to continue wolf research and monitoring, we recommend that it make a firm long-term commitment to do so. Justification for the program requires that it be conducted by a highly qualified principal investigator, that it be adequately funded so as to provide detailed demographic information, that it provide the opportunity to test research hypotheses relative to the factors that regulate wolf populations, and that there be a greater degree of stability established in the program than has existed in the past. The success of the program has been largely a function of the quality of the researchers conducting the work, as well as the willingness of both Denali NPP and USGS-BRD to dedicate considerable resources to the study of wolves and their prey. A lesser effort, conducted by researchers with less expertise and dedication, is not likely to produce results of the same high quality and would not be justified. Base funding of wolf-prey research would make a strong statement of park support for the work and would help to ensure the long-term success of the program. Layne Adams has indicated that he will not be serving as the principal investigator for wolf research in Denali NPP starting in the fall of 2002. We would recommend that if the park intends to continue this work that it seek out a highly qualified biologist to conduct it. This could be another researcher from USGS, an academic researcher, or the park, in filling its current opening for a wildlife biologist, could hire someone with the expertise to carry on wolf research. Dr. Adams has also expressed his desire to write up and publish the results from recent years. We strongly support this endeavor and hope that he will receive a solid commitment from USGS-BRD that will allow him to write up more of the story of the Denali wolves. The value of the work conducted at Denali – to the park, to the National Park Service, to the Alaska Department of Fish and Game, and to the scientific community – increases enormously when it is published, particularly in the peer-reviewed literature.

Some of the issues raised by this review suggest the need for a solution larger than what can be provided by a simple two-day, external review. One fundamental issue that remains unresolved is the tension between wilderness values and science values. Places where human impacts are minimized are rare. They are extremely valuable in furthering our scientific understanding of natural and healthy ecosystems. Wild places are also immensely important to the human spirit and the mere knowledge that such places exist has significant cultural importance. In the extremes, these values may be mutually exclusive. Fortunately, the solution may not lie in the extremes. Determination of the middle ground that constitutes a wise and equitable solution, however, is not at all clear. Although this conflict is not unique to Denali, we challenge the Denali staff to lead

the NPS in better understanding this conflict. Better understanding includes more broadly educating NPS personnel about what is understood about this conflict, and facilitating the advancement of our understanding of this conflict and its resolution by supporting synergistic interactions among professionals in the sciences, philosophies, social sciences, and land management.

In summary, we do not believe that a concerted research and monitoring program that includes radiocollaring is necessary for Denali NPP to manage for natural and healthy wolf populations. Such a program, however, is extremely valuable for its scientific contribution to our understanding of wolf/prey dynamics and there are very good reasons to continue the support of wolf research and monitoring at its present level. The maintenance of a high quality program that generates detailed demographic information about wolf populations requires radiotelemetry; at the present time, there are no less intrusive alternatives to gather the same level of information. We recommend that Denali NPP and the NPS encourage the development of less intrusive methods to monitor mammal populations and reevaluate methods and techniques in 5 years.

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