

Denali National Park and Preserve

Wolf-Human Conflict Management Plan



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WOLF-HUMAN CONFLICT MANAGEMENT PLAN

**Denali National Park and Preserve
Alaska**

2007

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PROBLEM STATEMENT

Wolves are among the most charismatic yet shyest species viewed by Denali's visitors. Throughout their range wolves generally avoid encounters with humans and are rarely observed. However, in cases where wolves are free from human persecution and have frequent opportunities to encounter people, individual wolves have become habituated and developed fearless behavior towards people. Furthermore, on rare occasions 'fearless' free ranging wolves have attacked humans (McNay 2002; Linnell et al. 2002, 2003; Grooms 2007). Because habituation of wolves in a park setting is a rare and relatively new phenomenon, wildlife managers have little experience in dealing with this situation and there is little published information on managing problem wolves.

Maintaining naturally regulated populations as part of an intact ecosystem is Denali National Park and Preserve's primary management objective for all wildlife species. For wolves, we intend to achieve this through the existing management programs such as road use restrictions, the visitor transportation system, the backcountry permit system and closures around active den and rendezvous sites. Informing park visitors how to behave in a manner that does not promote fearless behavior in wolves is the first step. The Wolf Encounters Brochure (Appendix G) is part of the park's educational program. However, in cases where fearless wolf behavior develops, a more manipulative strategy to modify wolf behavior is required. Failure to keep the park free of unnaturally fearless wolves may ultimately result in their removal.

Conditions Leading to Wolf Attacks

Linnell et al (2002) identified four factors associated with wolf attacks on humans: rabies, habituation, provocation, and highly modified environments.

Rabies

Rabies is involved in the majority of wolf attacks on humans worldwide. Rabid wolves go through a furious stage, during which a large number of people or animals can be bitten during a short time period. Rabid wolves tend to bite adults whereas attacks by non-rabid wolves tend to be on children. Victims of attacks by rabid wolves are never eaten. Although rabies has been reported in wolves from Arctic Alaska, there has never been a case reported in Denali National Park and Preserve.

Provocation

Several records exist of people being bit on the hand, arm or foot when they corner or confront a wolf trying to kill livestock or dogs. Records also exist of people being bitten by wolves while



trying to pull pups out of a den (Linnell et al. 2002). These defensive attacks usually consist of a single bite; the attack is short-lived and ends often with the wolf trying to escape.

Predation

Predatory attacks, which are extremely rare, usually involve single wolves or single pack to learn to prey on humans. These events tend to be clustered in space and time.

Habituation

All of the wolves that have attacked humans in North America have lost their wildness by being repeatedly exposed to humans and losing their fear of people as a consequence (Linnell et al. 2002, McNay 2002, Carnes and Van Ballenberghe personal communication). McNay (2002) defines habituation as “the loss of an animal’s fear response to people arising from frequent non-consequential encounters.” Some wolves in DENA are non-consequently exposed to people during the summer because their dens or travel routes are located near the park road corridor and roadside campgrounds. Habituation appears to be a prerequisite for an attack on a human (Linnell et al. 2002 and McNay 2002), and food rewards commonly promote habituation; however, there are cases of non-food-conditioned wolves attacking humans (McNay 2002). The first objective of this plan is to prevent wolf habituation. It is much more difficult to reverse habituation when it occurs. In the event that habituated or fearless behavior develops, this plan offers some methods that may reverse these undesired behaviors.

A factor leading to habituation is the age of the wolf. Overwhelmingly, most habituated wolves are young. Young wolves are curious, learning, and often not involved with killing prey and other pack activities, so are attracted to novel stimuli like humans and their belongings. If curious animals are not deterred by the objects they investigate, they can quickly become habituated. If reinforced by food, the wolves quickly learn that humans may be an easier source of food rather than work through the dominance hierarchy of the pack (yearlings are the lowest ranking wolves in the pack and often eat last at a fresh kill). Yearling wolves are probably the most susceptible to habituation, and the two most problematic wolves in Yellowstone National Park to date have been yearling males (Smith and Stahler 2003). The ages of wolves involved in close approaches in DENA are unknown. Other areas also report that young wolves are usually the ones that grow accustomed to humans. The Mexican Wolf Project in the American southwest and Banff National Park in Alberta, Canada also report problems with pup and yearling wolves. Adult wolves tend to avoid human contact, but still can pose a problem as seen in the incident in Icy Bay, Alaska when an adult wolf attacked a child (McNay 2002). Wolves born in Yellowstone in 1997, and exposed to large numbers of humans their whole life, avoid people. It appears that a critical period of time exists during which wolves can become habituated, after which they are not as susceptible, or revert to more people-averse behaviors after they mature.

Second to habituation, humans that act in a non-threatening manner appear to be a key factor in wolf attacks on people. Most attacks have been on adults lying prone on the ground or children. Wolves are generally threatened by people, and merely holding one’s ground and standing tall can deter even a habituated wolf. This is effective in deterring captive wolves, which are more dangerous than wild wolves, as they have long term experience with people and often are not



afraid of them. Yet a confident, tall human, or flaring one's jacket if not tall, or opening an umbrella, is often all that is needed to deter a captive wolf.

Summary of Wolf Attacks Worldwide

Recent studies summarizing wolf/human encounters worldwide have concluded that wolves are among the least dangerous wildlife species for their size and predatory potential (Linnell 2002, McNay 2002). In rare cases where wolves have killed people, most attacks were made by rabid wolves. Predatory attacks were aimed mainly at children, while attacks in general were unusual and episodic. In the 20th century, confirmed and suspected wolf attacks were rare and occurred mainly in Europe and Asia. Many were considered to have been due to rabies or predatory attacks. Since 1900, there have been a total of 273 attacks by wolves in all of Europe (> 80% by rabid wolves), resulting in 27 deaths. Combined reports from India, Afghanistan, Iran, China, and Russia yield a total of 1,579 attacks (70% by rabid wolves) resulting in 539 deaths (Linnell 2002). In North America, 19 attacks by presumably healthy wolves were confirmed in the 20th century (McNay 2002a), none of which resulted in death, whereas 6 attacks by confirmed rabid wolves were documented (1900-1950s), resulting in two deaths.

Attacks on Humans by Other Carnivores

It is important to put wolf attacks into context by comparing them with attacks by other large carnivores and wildlife species (as seen by the following review from Linnell et al. 2002). For example, between 1890 and 2001, 17 fatal and 72 non-fatal attacks by cougars have been reported in North America. In this same time period, 71 people have been killed by grizzly bears with an average of 4 attacks annually in North America. Outside of North America in the 20th century, tigers, lions, leopards, and Eurasian bears have killed a combined total of 6,297 people. Attacks by other wildlife species are much more common than large carnivore attacks. An average of 27,000 people in the United States are bitten by rodents annually; 750 by skunks, and 500 by foxes. Domestic dogs attack an estimated one million people annually in the United States. Carbyn (1989) described several coyote attacks on people in North America.

Despite the rarity of wolf attacks in North America, it is important to understand how documented incidents relate to managing wolf-human interactions in places like DENA. Of the 21 attacks by healthy wild wolves, three occurred during aggressive encounters between a wolf and a domestic dog in the presence of a human. The remaining 18 incidents were caused by habituated wolves. Five of these attacks occurred in Algonquin Provincial Park, Ontario, Canada, between 1987 and 1998 by four different wolves, again mostly on children. All four of the Algonquin wolves had been closely associating with humans for weeks or months leading up to the attacks and it is likely that some (but not all) of these wolves had obtained food from humans during that time. In 2000, on Vargas Island, British Columbia, Canada, habituated wolves attacked sleeping campers severely enough to require stitches. Habituated wolves on Ellesmere Island, Nunavut, have injured people as well. Two wolves were killed in Banff National Park because one killed a dog in a person's yard, and another was fed and approached humans. In 2001, DENA closed a campground because wolves were unafraid of people, became a nuisance, and stole shoes and cookware.



Human behavior was the primary factor involved in creating situations in which wolf-human encounters led to human injury from the North American incidents. Therefore, management of wolf-human encounters ultimately means managing human behavior to prevent wolf habituation. The objective of this plan is to acknowledge the existence of habituated wolves in DENA, and manage both wolves and humans to prevent wolf habituation, human injury, and wolf removal.

Habituated Wolves in Denali National Park and Preserve

During the period 1999-2002, several wolves at DENA became increasingly habituated to humans. The wolves most visibly involved, referred to as the East Fork pack, have historically denned within one and a half to three miles of the park road on the Toklat River, the East Fork of the Toklat, or the Teklanika River. Some of these wolves are frequently seen and photographed along the park road during the summer season and in the past have generally ignored humans. However, there are several documented accounts of similar habituation with members of the East Fork pack from 1991 and 1992, suggesting that this behavior may be a recurring or continuing concern.

Between 1999 - 2007 the East Fork pack used the Teklanika River den. This den is within 1.5 miles of the park road and close to Teklanika and Igloo Campgrounds. Due to the topography of the area, the road is often used as a travel corridor by the wolves, and the campgrounds are a normal part of their range.

During 1999 there were several incidents involving close, investigative approaches to people and campsites at Igloo Campground. Wolves also carried away some items from campsites at Igloo and in the nearby backcountry. In one instance the Igloo Ranger fired a noise-making round which did not elicit a response. During 2000, 2001, and 2002 there were 16, 37, and 5 documented reports of conditioned or fearless behavior in East Fork wolves. Reported incidents involved wolves in backcountry situations, encounters at Teklanika Campground and along the Park road. In 2001 we also recorded a few cases of conditioned or fearless behavior by wolves near the Park entrance areas. This pattern of wolf-human interaction continued in 2002, but with fewer events. Five of these interactions were classified as incidents where wolves exhibited fearless or conditioned behavior and/or caused property damage.

Igloo Campground was closed early in 2001 and through the 2007 season to reduce the chance for close human interaction with wolves and to lessen the chance for more habituation of the wolves to humans. On May 31, 2001 there were three significant interactions with wolves at Teklanika Campground. In the first encounter, six wolves approached a man while he was walking his dog. In the other two interactions three wolves, of a group of six, approached and investigated two tents occupied by adults and children. In response to these interactions and other information about wolf behavior of this kind, Teklanika Campground was also closed to tent camping. Wolves continued to pass through the campground occasionally during the summer and a few additional close approaches occurred there. A few unsuccessful attempts were made to haze or aversively condition wolves during the summer of 2001. Teklanika Campground was re-opened to tent camping in summer 2007.



This trend towards fearless or habituated wolf behavior results in the potential for wolves to obtain human food in campgrounds or backcountry camps. Similar situations in Algonquin Provincial Park, Canada, Yakutat, and Vancouver Island have been associated with attacks on humans on 7 different occasions (McNay 2002). Obviously, our concerns lie not only with the safety of park visitors but with the preservation of a naturally regulated wolf population within DENA.

INTRODUCTION

Denali National Park and Preserve currently receives over 600,000 person days of visitor use per year in an area with wolf (*Canis lupus*) densities ranging from 3.1 to 9.8 wolves per 1000 square kilometers (Mech et al 1998). As visitation to Denali continues to increase, so will the potential for impacts to wolves. Wolves are unpredictable animals that on rare occasions can seriously threaten human safety (McNay 2002). In Denali National Park, many people have the opportunity to observe wolves in their natural environment. In 1989, 20% of park visitors using the visitor transportation system were able to observe wolves along the park road (Machlis 1990). The park provides a valuable opportunity for the public to foster an appreciation and understanding of wolves. This appreciation and public support could enhance efforts to conserve threatened wolf populations in other areas.

Visitor use in DENA continues to rise. Consequently, the potential for conflict between wolves and people is a major concern. Wolf-human conflicts result in loss of wild and free ranging wolves and could threaten human safety. Habituation of wolves to people is a significant factor associated with wolf-human conflicts in parks and natural areas (McNay 2002). Although no human injuries have occurred in the park, the number of wolf-human incidents and encounters is high. During 2000, 2001, and 2002 there were 16, 37, and 5 documented reports of conditioned or fearless behavior in East Fork wolves. Incidents involving property damage were an annual occurrence during these years. The factors affecting wolf-human conflicts must be actively managed and the effects of management actions must be investigated. The continued experimental development and adaptive management implementation of a wolf-human conflict management program, by professional biologists and highly trained technicians, is essential to visitor safety and resource protection.

The purpose of the Wolf-Human Conflict Management Plan (WMP) is to provide guidelines that facilitate minimizing wolf-human conflict in DENA. The implementation of the Wolf-Human Conflict Management Program will follow four courses of action and their corresponding program elements: education, closures of active den and rendezvous sites within areas frequented by visitors, removal of attractants, and management actions in response to wolf-human interactions. The removal of anthropogenic food and garbage attractants is currently being accomplished effectively under the guidance of the bear-human conflict management plan and therefore is not addressed in detail in this plan. However, additional anthropogenic factors that attract wolves may be identified and subsequently managed.

It is important to recognize that each wolf-human incident may involve unique circumstances for which strict adherence to the procedures outlined in this plan are not appropriate. All the management actions outlined in the WMP emphasize starting with the least manipulative



method, relative to the situation. All DENA employees involved in wolf management actions must maintain lines of communication with any involved parties throughout the response period and ensure that management actions are documented. An animal's reaction to a particular management action must be documented in the Park's Wolf Encounter Form (WEF) database. Analysis of these data will allow park managers and researchers to better understand the effects of management actions such as aversive conditioning.

The WMP will evolve in accordance with continued monitoring and evaluation of its elements. The Wildlife Biologists and the Wildlife Management Technicians will evaluate the Wolf-human Conflict Management Program annually and document successes or inadequacies. An annual review of the program will include input from other members of the Park staff and wolf biologists from other agencies. Reviews will evaluate written and verbal information provided to the public, current data gathering systems, the experimental aversive conditioning program, the active den and rendezvous site closure criteria, and use of signs. They will also consider staff and budgetary necessities for the implementation of the WMP. Any relevant research findings will be evaluated for incorporation into policy and programs as part of an adaptive management approach to controlling wolf-human conflict. The Wildlife Biologists and the Wildlife Management Technicians will provide annual summaries or progress reports to expedite review.

Denali National Park and Preserve's Management Policy

Preventative management will be the first step toward minimizing wolf-human conflicts. Efforts will be focused on identifying and addressing the causes of wolf-human conflicts. Park-wide analysis of park operations along with management and education of visitors, businesses, and employees will minimize situations that could precipitate a wolf-human conflict. Closures around active den and rendezvous sites will minimize disturbances and help eliminate the potential for wolves to habituate to humans.

In circumstances where wolves present a threat to visitors despite preventative measures, visitors will be restricted or removed from the area. If this procedure does not resolve the problem, more manipulative management actions such as aversive conditioning, translocation or removal will be initiated.

Wolf behavior during wolf-human conflicts will be classified by the behavior categories defined in appendix B. Fearless (or habituated), rewarded, threatening, conditioned to people, and conditioned to campgrounds behaviors are considered undesirable. Educational materials will direct employees and visitors to behave in a manner that minimizes the opportunity for wolves to develop undesirable behavior. In cases where fearless behavior does develop, management responses will be directed towards modifying the animal's behavior through an experimental aversive conditioning program. Defensive behavior is considered natural with management responses directed toward the control of human activities. Threatening, fearless, conditioned, or rewarded behavior is considered unacceptable and management responses will be directed towards modifying the wolf's behavior. Translocation or removal of the wolf will be considered as a last resort.



The following actions are the Park's protocols to minimize and manage wolf-human conflicts and wolf habituation. Included are categorized wolf behaviors, potential management actions, definitions of these actions, and management procedures. These protocols are best viewed as general guidelines. There is no single method to manage a complex human and wildlife behavior management situation with many unknown variables. Every situation will be different. It is essential that these procedures be implemented in an adaptive management context. The outcome from a management action should be used to formulate the next step. Results should be continuously evaluated, both in the near term (from one minute or day to the next) and in the long term (from one year to the next).

Goals

The goals for wolf-human conflict management are to:

1. Maintain a naturally regulated wolf population as part of the intact ecosystem.
2. Provide visitor and wolf safety by minimizing wolf-human conflicts.
3. Minimize the effects of human visitation on the distribution, abundance and behavior of wolf populations by minimizing wolf-human conflicts.
4. Provide opportunities for visitors to observe, and understand a naturally regulated wolf population as part of an intact ecosystem.
5. Achieve these goals with a minimum of intrusive management actions.
6. Provide a framework for resolving wolf-human conflict if and when it occurs.

WOLF EDUCATION PROGRAM

Educational efforts will emphasize wolf behavior along with techniques for minimizing conflicts with wolves. Discussions will also emphasize the importance of the wilderness character of DENA to its natural wolf population. Appendix G contains copies of written educational materials available in 2007.

Information Distribution for User Groups

Alpenglow

Printed information for distribution to park users and employees will be centralized in a comprehensive article in the Denali Alpenglow. This information will discuss how to behave during a close encounter with a wolf. The Wildlife Biologist and the Assistant Superintendent of Resources, Science, and Learning will approve future revisions of the article.



Park and concession staff will distribute the Alpenglow. Visitors will receive this information at the Visitor Center (DVC), the Wilderness Access Center (WAC), and the Murie Science and Learning Center (MSLC). Copies of the Alpenglow will be available at the following locations:

- Inside the DVC, WAC and MSLC. After hours copies will be available outside of both facilities.
- The lobby of Park Headquarters and after hours outside the main door of Headquarters.
- The Savage Check Station.
- The concession employee cafeteria at the beginning of each season.
- Eielson Visitor Center.
- The Denali National Park and Preserve Official Web site.
- Copies will be mailed to individuals on request.

Concessions staff will get copies to the employee cafeteria. The Interpretive Division will maintain copies at all other sites.

Copies of the Alpenglow will be kept in patrol, wildlife management, and interpretive vehicles for distribution.

Wolf Encounters Brochure

The brochure will be available at the DVC Information desk, the campground ticket counter in the WAC, Savage Check Station, Eielson Visitor Center and at each of the Kantishna lodges. Translations in German, Japanese, French, and Spanish will be available. One copy of each translation will be provided to park road bus drivers for reference in their information packets. Patrol Rangers will also have copies of these brochures in their vehicles.

Bulletin Boards

The information in the wolf encounters brochure will also be displayed in bulletin boards in developed campgrounds. Information will be displayed as soon as areas open for the season. The Interpretive Division is responsible for posting of displays and their maintenance throughout the season. It may be necessary to post emergency messages relating to wolves. The Wildlife Biologist should be informed in these instances.

Interpretive Activities

The Wildlife Management Technicians and other wildlife staff will provide training sessions for the interpretive staff on wolf behavior and ecology at the beginning of each season. All public programs will include a message about the potential for wolf-human conflict while visiting DENA



and personal practices that can minimize conflict potential. Introductory remarks at guided walks will include the group's actions should they encounter a wolf. The Chief of Interpretation will assure that this information is conveyed to the public during these contacts.

Information for Backcountry Users

All parties obtaining a backcountry permit will receive verbal and written information about appropriate behavior during a wolf encounter. Foreign language speakers will be provided with the appropriate foreign language wolf encounter brochure.

Information for other Park Users and Neighbors

Other park users including subsistence users, mining operators, business license holders, concession operations, contractors, holders of special use permits, private land owners within DENA, and adjacent land owners have the potential to impact the Park's wildlife by inappropriate behavior around wildlife. The Wildlife Management Technicians and/or Rangers will inform these groups of the Park's policy and appropriate behavior during wolf-human conflicts. Emphasis will be placed on the methods and advantages of preventative measures. A notice discussing these points as well as relevant wolf activity updates will be maintained in public places such as the Denali Park Post Office and mailed to more inaccessible individuals and communities if problems develop in remote work sites and communities.

Training

NPS Employees-General

All NPS employees will attend a training session concerning wildlife-human conflict, including information on wolf-human interactions, that is part of the annual general orientation provided every May. Other safety training sessions will be available for employees who are unable to attend the general orientation. The session will be conducted at the same time as bear safety training. It will also emphasize the importance of minimizing wolf-human conflicts within the Park. The Wildlife Management Technicians are responsible for arranging and presenting these training sessions. **It is the responsibility of supervisors to ensure time is provided for their employees to attend.** Cooperative efforts of Park employees from all divisions will ensure the inclusion of these requirements in appropriate agreements. For specific individual responsibilities see Appendix M.

It is also the responsibility of all employees to place people who have been involved in a wolf encounter (see Appendix A for definitions) in contact with the Wildlife Management Technicians.

NPS and Contracted Employees with Visitor Contact Duties

The Interpretive, Dispatch, Ranger, and Concession staff that frequently engage in visitor contact will receive additional training on reporting procedures for wolf-human interactions, interpreting the park's wolf-human conflict policies and programs to visitors, and basic wolf biology and behavior. The Chief Ranger, Chief of Interpretation, and Chief of Concessions will ensure that this



training is incorporated into annual employee orientation and training sessions. The Wildlife Management Technicians will conduct these sessions.

NPS Employees Responding to Wolf-Human Incidents

Wildlife Management Technicians responsible for responding to wolf-human incidents will receive intensive training in reporting and interview procedures, incident scene investigation, incident response scenarios and procedures, temporary and emergency wildlife closure procedures, firearms handling, and use of deterrent and aversive conditioning devices. The Wildlife Biologists and/or returning Wildlife Management Technicians will provide this training. See Appendix E for details on training requirements.

Researchers and Contractors

All researchers and contractors working in DENA will be required to obtain training in wolf-human conflict avoidance. Training sessions will be tailored to the experience level of the group and their potential exposure to wolves. The Wildlife Management Technicians will present these sessions. The Park liaison to each of these groups will ensure that the necessary training is arranged.

Concession Employees

All concession employees will be provided with information about living, working and recreating in wolf country. Informational meetings will be held at various times to cover the information presented in the Alpenglow. These meetings will also include requests for employee reports concerning wolf interactions and situations throughout the park that could result in wolf-human conflicts.

The Alpenglow article and a memo summarizing the topics covered in these meetings will be posted at the employees' cafeteria, Visitor Transportation System (VTS) bus office and other concessions that desire to participate. The Wildlife Management Technicians will arrange and conduct these meetings.

Bus Drivers

Annual bus driver training will cover the driver's responsibility to minimize wolf-human conflicts. Drivers will be instructed to use the Alpenglow article as the basis for any wolf information given to the public. Bus drivers will be reminded that visitors are not allowed to leave a bus within $\frac{1}{4}$ mile of a wolf. Drivers should direct people involved in an interaction with a wolf to the Wildlife Management Technicians, Law enforcement Rangers, or NPS staff at the Visitor Center. The Visitor Transportation System Coordinator will arrange these training sessions that are conducted by the Wildlife Management Technicians.



Park Sled Dog Walkers (summer) and Dog Sled Patrols.

The presence of dogs has been suggested as a factor leading to wolf attacks on humans (McNay 2002). Although there has never been a physical encounter between park sled dogs and wolves during the summertime along the park road, dog walkers will be trained on what to do if they encounter a wolf. Avoiding encounters and safety of the people walking the dogs or using them on winter patrols will be emphasized.

Documentation

All training sessions will be documented and reported in the Annual Wildlife Management Report in order to monitor the time invested, number of people and groups receiving training, and effectiveness of the training. In general wolf safety training will be conducted in conjunction with bear safety training.

Reporting Procedures for Wolf-Human Interactions

Receiving Initial Reports

It is the responsibility of all NPS employees, bus drivers, and concession employees to direct people who have had an interaction with a wolf to report it to interpretive, law enforcement, or resource management staff. Staff should follow interviewing guidelines (Appendix F.) and fill out a Wolf Encounter Form (WEF). The Communications Center should be notified if the wolf-human interaction requires further action. Wildlife Management Technicians or Ranger staff will conduct further interviews and investigations.

Notification

The person receiving the initial report will notify the Communications Center and other parties once the general type of report is determined. If the incident requires an immediate action, the Communications Center will inform the District Ranger, Wildlife Biologist, Wildlife Management Technicians, and Chief Ranger. Visitors/residents in area that are in immediate proximity should also be notified immediately.

All WEFs will be routed to the Wildlife Technicians as soon as possible so they can effectively monitor wolf-human interactions in the Park.

Wolf Den and Rendezvous Site Closure Criteria

Objectives:

1. Protect whelping and denning wolves from human disturbance.
2. Protect wolf pups from human disturbance and from becoming habituated to humans.
3. Protect wolf dens from human-caused impacts including damage and destruction.



Denali National Park and Preserve's (DENA) method of wolf den protection consists of imposing temporary closures around occupied den sites within ten miles of the park road, or that are accessible to backcountry users. Sites used by wolves during the previous 2 years are closed during the spring (April 15 to June 1) when wolves are selecting a site, unless that wolf pack is known to be denning elsewhere and there is no indication of use at the old site. Areas around rendezvous sites are also closed when they occur in areas receiving visitor use. These closures are imposed to prevent disturbance to wolves during the denning and pup-rearing period and to prevent wolves from becoming habituated to humans. These closures are designed to achieve these two objectives in the least restrictive manner possible for backcountry users.

Methods & Procedures:

Beginning on or around April 15 every year the minimum area needed to protect den sites used during the previous 2 years is closed to allow wolves to select a den site without human disturbance. These sites are closely monitored for wolf activity from the ground and air by wildlife branch staff. Typically, by mid May the wolves have selected a den site. Park staff will monitor the activity of wolf packs denning within areas frequented by park visitors in order to detect packs with more than one breeding female. Between 1988 and 1991, researchers detected 9 cases of wolf packs having more than one breeding female (Mech et al 1998, Meier et al. 1995). Historic den sites will not be assumed to be inactive until carefully investigated at least twice during mid to late May. After den sites have been clearly selected, the closure boundaries are expanded to the 'summer maximum' for the active sites. Inactive den sites will have restrictions lifted at this time. This dynamic model for closing wolf den sites will protect sensitive active wolf den sites without unnecessarily restricting visitor use in the park.

When new active wolf den sites are detected in areas frequented by backcountry users, new closures will be designed and implemented. Closures are designed to exclude humans from the area within a minimum of one mile from the den or rendezvous site. Identifiable topographic features are used to delineate the closure boundaries where possible. Significant efforts are made to ensure that new closures do not unnecessarily impede backcountry travel.

Some wolf dens in Denali have a long history of known use; however, several have not been used for many years. Park managers began closing areas around wolf dens in 1973 following several reports of human disturbance at active wolf dens. In 1974, Mount McKinley National Park funded a research project to study the effects of human disturbance at wolf dens (Chapman 1977). One factor investigators studied was the effects of various types of human disturbance on den site abandonment. Because experimental human disturbance of wolf dens was not allowed in the park, disturbance experiments were conducted in a remote part of northern Alaska. Although human disturbance appears to cause den abandonment in some cases, no direct mortality was documented. Pups were moved to an alternate den site and reared successfully to at least 3 months old. Although Chapman (1977) suggested that pups could be lost during den site switches if exposed to inclement weather or river crossings, Mech (1993) documents 3 observations of wolf pups surviving inclement weather. Mech (1993) observed wolf pups in an open 'pit den' that survived 7 cm of snow fall, -2°C temperatures, and 11 cm of rain. In another observation, four 2-3 week old pups were observed crossing a snow field for up to 2 hours.



Chapman (1977) does not report on the rates of den site switching in the absence of anthropogenic disturbance, but den switching has been observed in the park (Mech et al 1998). Several other investigators report that human disturbance of den sites prior to pups being born causing den site abandonment (Joslin 1966, Stephenson 1974 in Chapman 1977). Human disturbance has also been suggested as a factor limiting re-use of dens in subsequent years (Chapman 1977); however, several reports of successful re-use following human disturbance also exist in the literature (Murie 1944 and others).

Closure boundaries follow easily identifiable topographic features and cover areas within a minimum of one mile from the den site. Their design accounts for visibility, backcountry users' travel patterns, enforceability, and topographic features. The closure boundaries are the minimum size that precludes human disturbance in the vicinity of the den. They are easily identified on a topographic map and on the ground, and they do not pinpoint the den location.

Mech et al. (1991) suggests active wolf den sites remain closed for 2 months following whelping. Although wolves in Denali generally whelp in mid May, these sites will remain closed until the wolves are no longer using the area. After this time, vacated wolf den areas will be opened to backcountry travel. Closure areas that contain active den or rendezvous sites will remain closed. Wolf packs will continue to be monitored after they leave the den site, if possible. Rendezvous sites that are detected in areas used by park visitors will be closed for the duration of the season, usually late September.

The protection of rendezvous sites is more difficult because their location is unpredictable. However, rendezvous sites are often located within one mile of the natal den, in which case they are likely to be within the same closure as the den site. If necessary, closure boundaries may be modified to account for rendezvous sites. Long-range movements to rendezvous sites are unpredictable. Denali wolves have freely moved their pups into areas with significant human use, which increases the likelihood of wolves becoming habituated to humans. Because of the undesirable effects of wolves becoming habituated to humans (McNay 2002), and to minimize disturbance, areas around rendezvous sites that are in areas used by park visitors will also be temporarily closed. These backcountry closures will be designed in a similar fashion to those for active den sites; the area within a minimum of one mile from the site will be closed using identifiable topographic features to delineate the boundaries where possible. Backcountry closures to protect wolf dens and rendezvous sites will be designed and implemented to adapt to current conditions.

Monitoring procedures:

Wolf packs that contain radio-collared wolves and are active within the areas easily accessible to hikers will be located every two weeks at a minimum during the denning season (generally April 15th to August 1st) to insure detection of active dens and den relocations. Wolf packs and den sites will be monitored using radio-telemetry from the ground and the air. The need to monitor wolf denning activity, while an important part of the Park's efforts to prevent human-wildlife conflict, is not sufficient to justify the placement of radio collars on wolves, if other research, monitoring or management needs do not further justify collaring. Monitoring data is



entered and stored in a digital database. Den sites in inaccessible or unfrequented areas do not require a closure.

Management Actions

1. Investigation

Any field action will be preceded by an interview with the people involved. The interview should follow questions outlined in the WEF and interview guidelines in Appendix F, emphasizing a detailed account of physical setting, location and actions/reactions of the humans and wolves involved. If the wolf is still in the area, the investigator should try to identify the animal. If it appears that further management actions will be needed, the wolf should be kept in view if possible, without provoking further interactions, until the Wildlife Management Technicians arrive.

2. Response Procedures

A quick response, within 12 hours, is essential to the success of management actions.

The Wildlife Management Technicians must be prepared to respond to wolf or bear management situations at any time and under any conditions. The overall effectiveness will increase if the initial team responding to the situation is capable of performing the full range of management options and is prepared to stay in the area for several days.

The preferred team is composed of two Wildlife Management Technicians, a third member of the resource preservation staff, or a Law Enforcement /Backcountry Ranger. Members of this team **must** be qualified with a shotgun. A person qualified in wildlife immobilization and wolf trapping and capture may also be needed. The team should be equipped to perform a full range of management actions including immobilization, marking, aversive conditioning, attaching a radio collar, behavior testing, and euthanizing a wolf.

Response to a backcountry incident:

- 1) Initial report and interview taken by field staff.
- 2) Field staff contacts Communication Center.
- 3) Communication Center contacts Wildlife Technicians.
- 4) Meeting point arranged for team and helicopter, if available.
- 5) Team members get gear and proceed to pick up point.
- 6) Consider fixed-wing aircraft support to help search incident area.
- 7) If possible one team member interviews victim. Consider taking victim to site if further clarification is needed.
- 8) Team goes to site and conducts preliminary search of area with aerial support if available and necessary.



- 9) If necessary, remove victim's equipment from the area.

The team will take the appropriate actions outlined under Field Guidelines section of this document and will be prepared to spend at least two days in the area.

Response to front country incidents -- driving a wolf away from a populated area:

- 1) Survey the area. Determine the number, color, and age classes of wolves involved. Always try and figure out what, if anything, might be attracting the wolf to the site.
- 2) Keep visitors out of the area and in a safe location.
- 3) If the wolf has not left the area, use the least disruptive techniques first. Make sure the wolf has an escape route. Yelling, waving arms, or throwing rocks is generally sufficient. Give the wolf time to react and proceed slowly. The objective is to remove the wolf from the area and not cause a confrontation that might result in a provoked attack.
- 4) If these techniques fail after repeated attempts, an NPS employee who has completed all necessary firearm and aversive round training may use cracker rounds or other non-lethal rounds to attempt to drive the wolf away from the immediate area. If the wolf is not radio-collared, marking it with a paintball gun is justified. Continued hazing the wolf after it leaves the area is not warranted. Always document management actions so their effectiveness can be analyzed.

An alternative team led by an individual experienced in investigating wolf incidents will go to the site if a preferred team is not available. The primary objective for this team is to retrieve any abandoned equipment and complete the initial phase of the investigation. This team may take no other management actions. A qualified individual may carry a shotgun.

3. Monitoring

Controlling problems with passive, preventative actions is the first step in most management action. This option must be exhausted before more aggressive management actions are taken. Monitoring a situation requires at least one employee remain on the scene until the situation is resolved.

When monitoring a situation:

- (1) Determine the number of wolves, age and coloration of wolves, location of people, wolf behavior, and direction of their travel.
- (2) Inform people in the affected area of the situation.



- (3) Continually patrol the area and remove easily obtainable sources of human food or other items that may be attracting wolves. Check visitor food storage for loose garbage or open garbage cans. Request visitors remove other attractions such as shoes and dirty socks and clothes.
- (4) Control movements of people and keep them away from the wolf. Give them a ride past the wolf or get them into a visitor center or back in buses or cars.

4. Closures

Specific procedures for establishing a temporary or emergency closure are given in Appendix H.

In addition to protecting active den sites (described above), the establishment of a closure enables the removal of people from a potentially hazardous situation such as a carcass, or the area of a recent incident. For backcountry situations, closures may also give the wolf a chance to move to a more remote part of the park before it has a second opportunity to come in contact with people.

In the backcountry, boundaries for closures will usually be the boundaries of the backcountry unit where the incident occurred. The adjacent unit should be closed if the incident occurred on or near the unit boundary. Boundaries may also be constructed to encompass only the hazardous area. Initial and subsequent patrols of closures are required in order to remove people from the area, to prevent entry by other visitors, and to determine if the closure is still required by looking for animals exhibiting unacceptable behavior (see below).

Frontcountry campgrounds should be considered for closure when incidents occur within campgrounds that are attributable to anthropogenic attractants within the campground or displays of fearless or other undesirable behaviors on two or more occasions. The Superintendent is responsible for decisions regarding the closing and opening of roadside campgrounds.

Criteria for establishing and opening closures are provided in Appendix H and in the Field Guidelines (Appendix K.). The duration and type of closure is dependent on the circumstance that caused it and the effectiveness of other management actions.

5. Patrols, Tests and Subsequent Management Actions

- (1) Patrols to Clear and Enforce Closures

Wildlife Management Technicians and/or Rangers will conduct patrols to remove people from a newly established closure and to prevent entry into the area.

- (2) Patrols to Identify Wolves with Unacceptable Behavior Patterns



Patrols will be conducted in response to specific incidents. The decision to initiate a patrol will be made by the Wildlife Biologists and the Wildlife Management Technicians. They will be conducted by the Wildlife Management Technicians and can include another qualified individual.

The purpose of patrols will be to determine the behavior patterns of potential problem wolves. Behavior patterns observed during a patrol will help determine the appropriate management action.

The team may make decisions in the field based on information they collect and the general guidelines in this plan. Management actions should be conducted in controlled areas and with close crowd control where appropriate. Explanations of the management actions being conducted should be provided to park visitors if personnel are available. When possible, the Wildlife Management Technicians should contact the Wildlife Biologists before more extensive or aggressive management actions are taken.

A wolf's behavior may be classified as **conditioned or fearless** if it returns after **one** attempt to scare it off during a test. Further evidence that includes an obvious interest and familiarity with unnatural food sources or other anthropogenic objects will cause the wolf's behavior to be classified as **rewarded**. If there is uncertainty, the animal should be classified as **tolerant** until more tests clarify the animal's behavior. If a wolf demonstrates **threatening** behavior, immediate actions should be taken as outlined in the Field Guidelines.

Specific Management Procedures:

1) Wolf frequenting developed areas:

The incident area will be patrolled frequently by both Wildlife Management Technicians and Law Enforcement Rangers, at a variety of times with patrols concentrated during the same time frames each day that the wolf was observed. It is important for staff to attempt to identify what is attracting the wolf to the developed area and what behaviors are being displayed. If the wolf is attracted to items such as shoes, tents, or pets then specific guidelines or regulations should be considered and implemented to restrict certain activities within the campground. It is important to monitor the effectiveness of any restrictions, and reevaluate whether they should be continued at least once every year.

Personnel who are not qualified to take further management actions such as marking, aversive conditioning, or capture, may be used to monitor situations or on patrols. They will keep any wolf in sight that exhibits the behavior of the animal involved in the incident. Their responsibility is to monitor the situation, and notify the Communication Center or the Wildlife Management Technicians so more qualified personnel can respond. The Wildlife Management technicians should stay in close contact with campground hosts when wolves are frequenting



campgrounds. Prior to and during these patrols, the area should be checked and cleared of unsecured, anthropogenic attractants or food so that any wolf that enters the area will not obtain rewards. This procedure is useful in the identification of conditioned or fearless behavior.

2) *Wolf demonstrating fearless behavior or food conditioning to backcountry camps.*

Wildlife Management Technicians will set up a camp in the area where the incident occurred as soon as possible (within 12 hours of the incident). Typical behavior of a camping party will be followed; preparing meals at typical times, using standard backpacker's food, storing food in sealed plastic bags in BRFCs, etc. However, they will remain in their tent as much as possible, especially if there is a wolf near the area. If possible, a third person at a vantage point will maintain radio contact with people in the tent while watching for approaching animals. Wolves entering the area will be monitored. The camp should be maintained for two to five days depending on the wolf's response. If a wolf, exhibiting the type of behavior described during the incident is observed, appropriate procedures will be taken, as outlined in the Appendix K.

3) *Wolf that approaches, threatens or follows people:*

Wildlife Management Technicians will patrol the area in an attempt to locate and assess any fearless wolves in the area. They will approach any wolves they encounter until the wolves are definitely aware of the team. The team should maintain a distance of one to two hundred meters from the wolf. The team's objective is to determine whether threatening, fearless, or rewarded behavior is present, without eliciting a normal defense or dominance-related reaction. Approaches of less than 50 meters should not be necessary in backcountry situations. Closer approaches may be necessary in the frontcountry. The team will remain in an identifiable position for ten minutes. No actions will be taken if the wolf shows no reaction or it moves off. If approached by the wolf the team will attempt to mark the animal (paintball). The team will then attempt to scare the wolf off beginning with the least aggressive method. If scaring the animal away is difficult and it continues to approach or is deterred but approaches again later it is considered fearless. If possible, at this point the animal(s) will be captured and fitted with a radio collar. The marked wolf can then be readily located and identified, allowing further management actions as outlined below and in the Field Guidelines section of this document.

6. Firearm Use for Management Actions

A large caliber handgun or a 12-gauge shotgun with slugs will be the primary back-up weapons for any marking, capture, aversive conditioning, or destruction actions. The individual with the capture gun may also carry a handgun, if properly qualified. Only employees who have participated in a park approved firearms training session,



conducted by a certified firearms instructor, which specifically covers the use of firearms in wildlife management situations (Appendix I), may participate in these operations. The Wildlife Biologist will select individuals for this training as needed.

7. Marking

Wolves may be marked as part of approved research projects or resource management actions. The selection of the animals and how they will be marked will be made by a Wildlife Biologist based on the Field Guidelines (Appendix K.) of this plan. Only animals with a demonstrated history of unacceptable behavior will be marked for management purposes.

Radio collaring is the preferred method for marking and requires approval by a Wildlife Biologist. Wildlife Management Technicians **may** mark a wolf with a paint ball gun if the animal is exhibiting unacceptable behavior. Marking attempts will be terminated if the wolf's behavior indicates a high potential for injury to the wolf. Wolf capture will follow the protocols outlined in Appendix J.

8. Immobilization

(1) General Authorizations for Capture Equipment and Immobilizing Drugs

The use of capture equipment and immobilizing drugs will be restricted to employees with specialized training and experience in animal restraint techniques and equipment, and who have been specifically assigned to wildlife immobilizing actions (Appendix J). Decisions concerning the individuals receiving this authorization and training will be made by a Wildlife Biologist.

(2) Capture and Care

Wolves will be captured or immobilized (Appendix J) only for approved research or resource management actions. At present, management-related immobilization is limited to marking or radio collaring wolves for aversive conditioning tests, translocation or removal. The decision to capture a wolf and the method of capture will be made by a Wildlife Biologist. The Superintendent is informed in all cases. Immobilization for translocation, or removal requires the approval of the Superintendent.

Wolves may be captured by use of drug injecting dart, or other live trapping methods. The dart technique is preferred because it is the most discriminating method. Other methods may be used when circumstances indicate a high probability of capturing a specific animal that has an established behavioral pattern. Repeated attempts and different strategies will be tried before the immobilization option is completely abandoned, especially for wolves that must be destroyed if capture attempts fail. In most cases, capture operations will be



conducted from the air with the use of a helicopter and support fixed-wing aircraft. When darting is conducted from the ground, transmitter darts should be used to keep track of the animal after it is darted and before drugs take effect.

It is the responsibility of the person leading the capture operation to ensure that all participants are aware of the exact plan of action and their responsibilities for the capture attempt. General health and plane of anesthesia of immobilized animals will be monitored. Wolves should be kept cool and eyes covered. Whenever practical, one person will stay with the wolf during the entire drugging, handling, and translocation process in order to provide continuity in monitoring response to drugs and provide care to the animal.

See Appendix J for complete wolf capture protocols.

9. Hazing and Aversive Conditioning of Wolves

Hazing and aversive conditioning are the primary management actions directed towards wolves that display fearless, conditioned, rewarded, or threatening behavior. These techniques range from yelling and arm waving to using paint guns, rubber slugs, beanbag rounds, cracker shells, or capsicum spray,. Aversive conditioning is designed to eliminate a detrimental, unsafe, or unnatural behavior.

In general, aversive conditioning is conducted in a manner where its effectiveness can be tested. Management actions in the future should be based on past experiences so clear and complete documentation is essential. Ideally, candidate animals should be radio collared and frequently monitored prior to any aversive conditioning treatment. The animal interactions with the attractant can then be compared before and after the aversive conditioning treatment. For more information on possible study designs to test the effects of aversive conditioning see Appendix N.

Park staff should be informed of ongoing Wildlife Management activities and interpreters should be provided information to share with visitors regarding the history and reasoning behind current wildlife management activities. Interpreters will be encouraged to share this information with visitors at interpretive programs.

Potential Situations Warranting Hazing or Aversive Conditioning

The categorization of wolf behaviors and management responses to these behaviors provides an immediate list of options (Appendix B). Wildlife Management Technicians will respond to situations using this documented protocol as a starting point. However, wolf-human interactions are unpredictable and vary in cause and scope, therefore decisions must be made by logically assessing each situation. The following is a list of situations in which hazing or aversive conditioning of wolves may occur:

- Wolf frequents a frontcountry campground
- Wolf approaches humans
- Wolf approaches a backcountry camp
- Wolf exhibits fearless or other unacceptable behavior



- Wolf damages or removes property
- Wolf gets anthropogenic food
- Wolf causes human injury

General Procedure:

- a) Assess the situation. Does it warrant action or will it resolve itself acceptably given time and monitoring? How many wolves are there? What color are they? What is the age class of the wolf or wolves? Define your objective. Have as many facts as possible before initiating aversive conditioning.
- b) Remove spectators from the area before initiating any actions if possible. However, opportunities to haze an animal are extremely ephemeral and rare. If it is completely safe to proceed, hazing may be conducted in the presence of visitors. Provide interpretation if possible. Always provide the wolf with an escape route.
- c) Mark the wolf with a radio collar for positive identification for future management actions.
- d) Apply techniques in a progressive manner; use the minimum tool that will safely accomplish your objective. In general, yelling, loud noises, and rock throwing should precede uses of cracker rounds, or capsicum-based sprays. If these techniques fail, more aggressive methods such as rubber slugs or beanbag rounds may be used. See appendix K (Field Guidelines) sect 9.1.c for a list of appropriate distances for the different types of aversive conditioning rounds.

The success of cracker rounds, rubber or plastic slugs, beanbag rounds, and capsicum-based sprays may vary between individual animals. Only properly trained individuals can use these techniques.

- e) "Invisible Fence" technology is often used to restrict the movements of pet dogs, and could have potential for keeping wolves out of areas where they are not wanted, such as campgrounds. However, the high level of intrusiveness, the high probability of negative public reaction, equivocal results of shock collar tests on wolves (Schultz et al. 2005, Shivik and Martin 2000, USFWS et al. 2002, Shivik et al. 2003), and the need to take stronger action in response to truly inappropriate wolf behavior argue against the use of this technology on wild animals in park settings. Similarly, other aversive devices that have been used with some level of success in keeping wild animals away from livestock, such as the Radio Activated Guard (RAG) box (Breck et al. 2002) are not considered suitable in Denali because of their disruptive effects on visitor experiences..



- f) An electrified tent (E-tent) is a tent covered with electric fence wire. This experimental aversive conditioning tool could be deployed in either the backcountry or the frontcountry when tents are the attractant.
- g) Aversive conditioning must be conducted several times, often over several days. If these attempts fail, management actions may be escalated. In frontcountry situations, managers will consider accelerating the response.

Limitations and Guidelines for use of Cracker Shells:

- Cracker Shells are not always effective. Wolves quickly learn to ignore them after repeated use.
- Their use is limited to open areas.
- Be aware of the threat of fire if cracker shells are used in dry forest or brush.
- Place the explosive between you and the wolf. An explosion behind the animal may scare it towards you.
- Remember that there is the potential to injure or kill a wolf if they are hit with cracker rounds.

Limitations and Guidelines for Use of Rubber or Plastic Bullets:

- There is the potential to injure or kill a wolf with a misplaced shot at distances of 35 meters or less for plastic slugs, 10 meters for bean bags. Slug placement in the rump or shoulder area will minimize potential for injury.
- Accuracy and effectiveness diminishes beyond distances of 45 meters for slugs, 30 meters for beanbags.
- In the case of wolf deaths resulting from management actions, a panel consisting of at least one Park representative, a Regional Director's representative, and two non-NPS wildlife management experts will convene to review the circumstances surrounding the death. The review will assist the park in evaluating current wolf management procedures and developing wildlife management program direction.

10. Translocation

The translocation of wolves has been used successfully in many cases, most commonly in moving livestock-depredating wolves to areas where they were less likely to cause depredations. In Minnesota (Fritts 1985) and in the Northern Rockies States (Bradley et al. 2005), translocation was used as a management technique with varying degrees of success, depending on the age of the wolves involved, the distance they were moved and the circumstances of their release. Wolves that were younger, that were translocated



longer distances, and that were held for a time at the release site (soft-released) were more likely to take up residence near the release site or elsewhere, rather than return to where they were captured. In more populated areas, wolf release sites can be difficult to arrange, because of the reluctance of land managers and local residents to have "problem" wolves moved to their area. In Denali, with very low human numbers around most of the park's periphery, it is possible to move wolves considerable distances yet still release them within the park/preserve boundaries and avoid areas inhabited by humans. Translocation of wolves in Denali will of necessity involve aircraft, because of the need to move wolves a considerable distance away from human-occupied areas. Because of limiting landing sites for fixed-wing aircraft in the western Park/Preserve, a helicopter will be the preferred vehicle for both capturing and transporting wolves. Translocated wolves should be radio-collared so that they can be monitored after their release. Release sites should be selected based on maximal distance from the capture site and lack of proximity to human settlements. While the survival of a wolf dropped off in the midst of strange wolf pack territories is certainly in question, it presents a situation not unlike the ones that dispersing wolves commonly find themselves in. Wolf translocation should always be considered as an alternative to the destruction of a wolf, except for cases where the wolf has caused significant injury to a human.

11. Removal (Destruction)

On lands within the boundaries of Denali National Park and Preserve, a wolf can be killed if it presents a critical and immediate threat to human safety and after other means of deterrence have been exhausted.

The decision to destroy a wolf may be made if it meets the following criteria:

- (1) Attempts at aversive conditioning and translocation have failed. The wolf has returned to the site and the unacceptable behavior pattern still exists. Or,
- (2) An animal is positively responsible for an injury or fatality resulting from a non-defensive or unprovoked attack. Or,
- (3) An animal has sustained a seemingly fatal, human-caused injury (gunshot, broken bones due to vehicle collision, etc.). And,
- (4) Wildlife Managers, with consensus from the Superintendent, determine that it is in the best interest of the park's wolf population and the natural systems involved to forego further behavior modification or translocation efforts

A committee, comprised of the Superintendent, Wildlife Biologist, Assistant Superintendent of Resources, Science, and Learning, Chief Ranger, and individuals invited to the committee by a designated member, will review the records of wolves which are candidates for destruction and discuss management alternatives. The committee will ensure the fulfillment of all actions specified in this plan. If the committee recommends destruction, the Wildlife Biologist will write a 'determination'



for the superintendents signature. Except in emergency situations involving a critical and immediate hazard to human safety, the final decision to destroy a wolf will be made by the Superintendent.

The destruction of a wolf is contingent upon a positive identification of the wolf.

Destruction and disposal procedures.

- (1) When possible, wolves identified for destruction will be chemically immobilized and shot in the head with a large caliber pistol to ensure a quick death. A wolf will only be shot while free roaming in cases where its presence is an immediate threat to human safety.
- (2) Except in emergency situations, wolves will not be destroyed within sight of visitors.
- (3) All identifying tags and radio transmitters will be removed and returned to the Wildlife Management Technicians.
- (4) A full necropsy will be performed and all relevant specimens collected. Parts from wolves killed may be used for research or interpretive programs in accordance with the appropriate guidelines covering natural history collections. Parts will not be retained by any interest for personal purposes or monetary gain.
- (5) When these outlets are unavailable, destroyed wolves will be returned to the ecosystem in locations far enough from roads, trails, and developed areas to minimize human interaction with scavengers or buried in the fenced garbage holding area along Highway 3. Disposal locations will be approved by a Wildlife Biologist. Necessary area closures will be established where carcasses have been left in the backcountry until the carcass is consumed.
- (6) Alaska Department of Fish and Game will be notified of any destruction in the 1980 park additions or Preserve.

Injury or Fatality

This section outlines response to any wolf-human interaction that results in human injury or death. All persons involved must recognize the high media profile of such an occurrence and conduct themselves and the transfer of information accordingly.

If a wolf attack is reported to you:

1. Immediately begin a comprehensive log.



2. Maintain direct contact with the individual reporting the incident and obtain:

Name
Phone number
Location
Location of incident
Time of incident
Number of people involved
Number of people injured
Extent of injuries and property damage
All people accounted for? Y/N
Number of wolves involved
Last known location of wolf
Distinguishing characteristics of wolf

3. Immediately contact the following:

Communications Center: (907) 683-9555
The Communications Center can assist with further contacts.
Medical assistance (if necessary): (907) 683-9555
Wildlife Management Technicians: (907) 683-9574
East-District Ranger: (907) 683-9527
West-District Ranger: (907) 683-9525

4. As soon as immediate contacts have been made notify the:

Wildlife Biologist: (907) 683-9547
Supervisory Wildlife Biologist (907) 683-9572
Assistant Superintendent of Resources, Science, and Learning (907) 683-9581
Chief Ranger: (907) 683-9521
Public Information Officer: (907) 683-9583
Superintendent: (907) 683-9581

5. Designate an Incident Commander from the list of individuals contacted.

Responsibilities

Incident Commander

1. Call medical assistance or place it on standby, as required.
2. Appoint 3-5 member Initial Response Team trained to deal with medical emergencies, wolf management, and scene investigation, comprised of the following:
 - Wildlife Management Technician(s)
 - Park Ranger(s)



- Translator (if required)

3. Establish a **Field Leader**. This individual may be part of the Initial Response Team. If not part of the Initial Response Team, he/she will assume command of the field operation upon arrival on the scene.
4. Initiate closure procedures.
5. Maintain a written record of the entire incident and response.
6. Ensure that each team member maintains a written record of his/her activities.
7. Notify Public Information Officer.
8. Keep the Superintendent, Assistant Superintendent of Resources, Science, and Learning, and Chief Ranger apprised of the status of the incident and response.

Field Leader

1. Evaluate available information.
2. Secure and evacuate all nonessential personnel from the area to insure safety.
3. Ensure the complete closure of the area.
4. Maintain communications with Incident Commander.
5. Establish teams to deal with a) Medical Emergency, b) Wolf Management, c) Scene Investigation if necessary. Appoint Team Leaders as appropriate.

Wildlife Management Team Leader (Wildlife Biologist)

Implement the following procedures based on the circumstances:

1. If injury/fatality occurred as a result of defensive, provoked, or unknown behaviors:

- Separate wolf and people. Monitor the situation and keep the wolf in view if possible.
- Provide information on how incident could have been avoided.
- Document all actions.

A. Wolf remaining in the immediate area of the incident, **identification positive:**

- Continue to observe animal for three days and close areas that it enters to prevent further contact with people.



- Conduct patrols to verify the wolf is an unusual threat to people or if incident was unique.
- If test patrol determines the wolf's behavior is **Fearless, Conditioned, Rewarded,** or a **Threatening**, destroy the wolf.

B. Wolf not in area or its identification is uncertain.

- Initiate closures in areas where it is suspected the wolf may have moved to.
- Conduct patrols to identify the wolf involved in the incident.
- If the wolf is positively identified, follow the procedures outlined in A.

2. Non-defensive, unprovoked attack aimed at securing anthropogenic food. Fearless, Conditioned, Rewarded, or Threat behavior is positively present:

A. Wolf still in immediate area of incident, behavior and identification positive:

- Destroy.
- If there is doubt about the positive identification consider genetic techniques to positively identify the wolf.

B. Wolf not in area:

- Initiate patrol procedures.
- Open area when situation resolved or when five days of patrols have been conducted without contacting a wolf with unacceptable behavior.

C. Wolf was destroyed:

- If wolf originally contacted was destroyed, continue test patrols for an additional three days and nights after the relocation to determine if the correct animal was destroyed.
- If another animal is contacted during these additional patrols then see 1B.
- If no wolf is contacted exhibiting Fearless, Conditioned, Rewarded, or Threat behavior after this additional patrol period, open the closure.

Scene Investigation Team Leader

1. Ensure victim is interviewed:

- Take measurements, photographs, and sketches of wounds.
- Examine victim's clothing for hairs, punctures, and tears.
- Remain in contact with medical personnel attending to the victim and obtain details.
- Collect samples of blood, hair and tissue from wolf for future DNA analysis.



- Determine the level of wolf safety information received by the victim before the incident occurred.

2. Incident site investigation.

- If approaching scene by helicopter, avoid landing at incident site, which could disturb evidence.
- Ensure tracks and other sign is not disturbed by people walking around at the scene.
- Take measurements and photographs of wolf prints at the scene. Note unusual marks and make a plaster cast of prints.
- Take measurements and photographs of injuries, especially with visible bite and claw marks. Note the location of the injuries on the victim's body.
- Photograph, measure, and record all data.
- Note surrounding vegetation and growth stage.
- Identify likely directions of the wolf's approach and departure.
- Identify landmarks for location from air search.
- Investigate and note all natural and human food sources.
- Map trails, paths, and footprints.
- Collect scats for DNA analysis.
- If the suspect wolf carcass is available, secure a cloth bag over the animal. Use paper if cloth is not available. Avoid plastic.
- Deposit the wolf carcass to an available cooler as soon as possible.
- Bag any material from scene for examining for tooth and claw marks and recovery of wolf fur and possible wolf blood. VERY IMPORTANT - transport dead wolf and evidence from victims in separate vehicles. NOTE - Bloody material should be air-dried at room temperature. If it cannot be air-dried then it should be kept frozen.
- Collect the victim's clothing in a bag for identification of blood and wolf fur. A cloth bag is preferred, but plastic is acceptable if clothing is dry. If the clothing is wet, air dry at room temperature.

3. Interview the general public who use the area or have recently been in the area and may have observed wolf activity.

Communications Center

1. Assist by performing call-out emergency response personnel.
2. Monitor and record radio communications between Incident Command and the Initial Response Team.



3. Process closure notices.
4. Keep Superintendent informed.

Public Information Officer

1. Responds to requests for information from the news media.
2. May appoint one park spokesperson who is directly involved with the operation to provide press statements.
3. Prepares written news releases.

In the case of human fatalities, a Board of Review will be convened, consisting of the Superintendent, Regional Director's representative, and two non-NPS wolf experts (from state, Federal agencies, universities, etc.)

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Appendix A: Definitions

Aversive conditioning: A tool used by managers designed to modify undesirable behavior of marked animals. An attempt to modify an animal's behavior through use of loud noise, aggressive action, or physically contacting an animal with non-lethal projectiles. These techniques will be used in a progressive manner. Least invasive methods will be used first with more aggressive action taken if animals fail to respond. Methods used on unmarked or unrecognizable animals are usually considered as hazing, while methods used on positively identified or marked animals are documented as aversive conditioning. Managers can often test the effectiveness of aversive conditioning by measuring the animal's response to the object of conditioning after the conditioning treatment.

Noise making (low-level): Includes yelling, banging pots and pans, honking horns or sirens.

Noise making (high-level): Includes pyrotechnics such as cracker rounds fired from a starter pistol or shotgun.

Aggressive Action: Chasing the wolf off with a combination of noisemaking and advancing toward the wolf, waving arms, etc.

Non-lethal projectiles:

Paint pellets: The least invasive physical contact. They are accurate, safe, and have the least impact. Under ideal conditions the paint marks last two weeks.

Bean bags: A 12-gauge round with an effective range of 5-20 yards. Non-marking, but more impact.

Rubber slugs: A 12-gauge round made of soft, flexible rubber with a range of 15-30 yards. Non-marking and highest impact at this range.

Backcountry: Areas greater than 400 meters from developed areas and greater than 200 meters from the park road. The preservation of natural processes is the overriding management objective in backcountry areas.

Conditioned Behavior: The recurrence of harmless, close encounters between humans and wolves may eventually cause wolves to lose their fear of humans. This is especially true for young wolves whose behavior patterns are still developing and are not involved in the packs hunting activities.

Curious Behavior: Wolves sometimes approach humans in an attempt to identify a scent or an object. Generally, they leave the area once they have come close enough to catch a human scent or sound. These interactions are considered to be a natural reaction and no management actions will be directed toward the wolf.



Documentation: All wolf-human interactions, wolf monitoring, and management actions will be carefully documented with field notes, Wolf Encounter Forms, or Case Incident Forms.

Encounter: Any interaction of close proximity (less than 50 meters) between wolves and humans during which the wolves exhibits a behavior that identifies that it was aware of the human presence. Encounters include all cases of wolves advancing on humans that do not result in property damage or physical contact. This includes instances when a wolf is driven off, or when the wolf showed indifference to humans in close proximity.

Encounters include:

- Indirect and hesitant approaches in distances less than 10 meters from a human.
- If humans attempt to scare a wolf away and it leaves without making contact or remains lingering.
- Cases when wolves damage property that is considered part of their normal environment such as road signs, culverts, picnic tables, scratching on cabins. Similarly, it is an encounter if a wolf touches, sniffs, or plays with a Bear Resistant Food Container (BRFC) or other gear. Chewing on empty plastic bags, etc. out of curiosity does not constitute property damage and is also considered an encounter.
- Wolves periodically interact with vehicles along the park road. It is an encounter if it bites on a bumper, or looks in a window. However, if damage occurs as a result of this interaction it is considered an **Incident**.

Food Conditioned: A wolf that has obtained anthropogenic food may perceive human beings and/or their facilities as sources of food. This association of human scent and equipment with food could encourage a general curiosity about people in other non-camp situations. This behavior pattern is unacceptable. Wolves that exhibit them will be subjected to aversive conditioning. Also called **Rewarded Behavior**.

Frontcountry: includes all developed areas such as campgrounds, residence areas, MSLC, visitor centers, and a zone of 300 meters around them. A 400-meter wide corridor centered along the park road and the general area enclosing the Visitor Center, Riley Creek Campground, and the train station are also considered frontcountry. Maintained trails are considered frontcountry for the wolf-human interaction analysis portion of this plan.

Habituated: A wolf that is indifferent to a stimuli or event due to repeated exposure. For example, a wolf that does not respond to buses because it lives along the road corridor.

Hazing: A management action directed at wolves that are not permanently marked (this includes animals marked with paint pellets) when it is necessary to quickly deter them from problem areas or when radio collaring is logistically impossible.



Incident: Any interaction during which a wolf makes minimal physical contact with a human that does not result in injury (e.g. walking on a human in a tent, touching a human with a paw). Incidents include any damage or loss of property or food. It is also considered an incident when a human is forced to take extreme evasive action (climbing a tree, playing dead, firing Counter Assault, etc.) in response to a wolf, regardless if the action seems justified.

Incidents generally include interactions in which wolves exhibit unusual behavior and require a response that includes a **Management Action**. The wolf's behavior is the most important component in determining the appropriate management action.

Incidents include:

- Instances when a wolf purposely walks to within 1-2 meters of a human or makes multiple approaches within 10 meters of humans making noise.
- For distances greater than 10 meters it is only an incident if the wolf makes a secondary charge to within 10 meters or if extreme aggressive behavior is exhibited.
- When a wolf touches a tent with humans inside or lingers near it showing interest.
- When a wolf approaches a camp in which humans have been active for a prolonged time, it is an incident.

Injury: Any instance when a wolf makes physical contact with a human and a wound results. This also includes cases when a human is hurt escaping from a wolf.

Interaction: Includes encounters and incidents but does not include sightings.

Investigating: All incidents involving wolves and humans will be investigated when possible, as soon as Park Rangers or Wildlife Personnel can arrive on scene. Due to the nature of many backcountry incidents, information may be days old and site visits impractical. In such cases an attempt should be made to get a thorough report from parties involved.

Management Action: Any technique used to modify a wolf's behavior including aversive conditioning, hazing, and destruction.

Marking: Wolves will be marked to accurately identify them for monitoring and evaluation of behavior changes during hazing or aversive conditioning attempts. The least invasive marking technique is by paint ball. Paint used is oil-based and normally wears off within two weeks. Radio collaring and ear tagging is more invasive and will be used only for food rewarded, destructive, or aggressive animals.

Mistaken Prey Behavior: Charges and injuries may occur when people are between a wolf and prey, or are mistakenly perceived as natural prey by wolves. These interactions can be considered the result of confusion; management actions may not always be necessary.



Monitoring: Monitoring is accomplished through regular campground visits and patrols, road patrols, den site observations to observe wolf behavior, reviewing Wolf Encounter Forms and radio tracking when possible.

Predatory Behavior: A wolf stalks a human as prey. This behavior is unacceptable. Identification of this behavior requires the destruction of the wolf.

Provoked Behavior: Approaches by humans to within 50 meters, continued approaches, or following a wolf, may constitute harassment and could provoke aggression.

Management actions may be directed toward the wolf, but is not required since its reaction is regarded as natural, defensive behavior. Law enforcement action may be directed toward the people involved.

Removal: Destruction of a wolf.

Rewarded Behavior: A wolf that has obtained anthropogenic food may perceive human beings and their facilities as sources of food. This association of human scent and equipment with food could encourage a general curiosity about people in other non-camp situations. These behavior patterns are unacceptable. Wolves that exhibit them will be subjected to aversive conditioning. Also called **Food Conditioned**.

Sightings: A wolf is seen by people but is never aware of their presence.

Surprise Behavior: A wolf suddenly confronted by a human may try to escape but if an escape route is unavailable, it may become aggressive. This is considered defensive behavior and no action is required.

Threat Behavior: Aggressive behavior that is not defensive, provoked, or a result of confusion. The wolf reacts with threatening postures to human attempts to scare it off. Animals exhibiting this behavior are considered dangerous because of their predisposition to react violently during interactions. This type of incident and behavior has not occurred in Denali. Wolves suspected of this behavior would be tested using the procedure outlined in the Field Guidelines. Positive identification of this behavior may call for destruction.

Tolerant Behavior: A wolf that is indifferent to human presence. This behavior is considered acceptable in isolated encounters as long as it does not involve a regular pattern of subsequent approaches. An animal may be naturally tolerant. If due to repeated exposure to people, a wolf becomes indifferent to humans it is considered habituated. If it is apparent that the wolf is beginning to linger around people or facilities the behavior may be unacceptable and the wolf should receive hazing and/or aversive conditioning.

Translocation: The movement of an animal to an area distant from the scene of a problem. In Denali, translocation will involve the capture and drugging of an animal, and transporting it



by aircraft (preferable helicopter) to an area as far removed from the scene of a problem as possible, while remaining in the Park/Preserve and away from human habitation.

Waste: Discarded food and drink, garbage, litter, recyclable materials that may contain remnants of food or drink, or other decomposable material that might have odors attractive to animals.

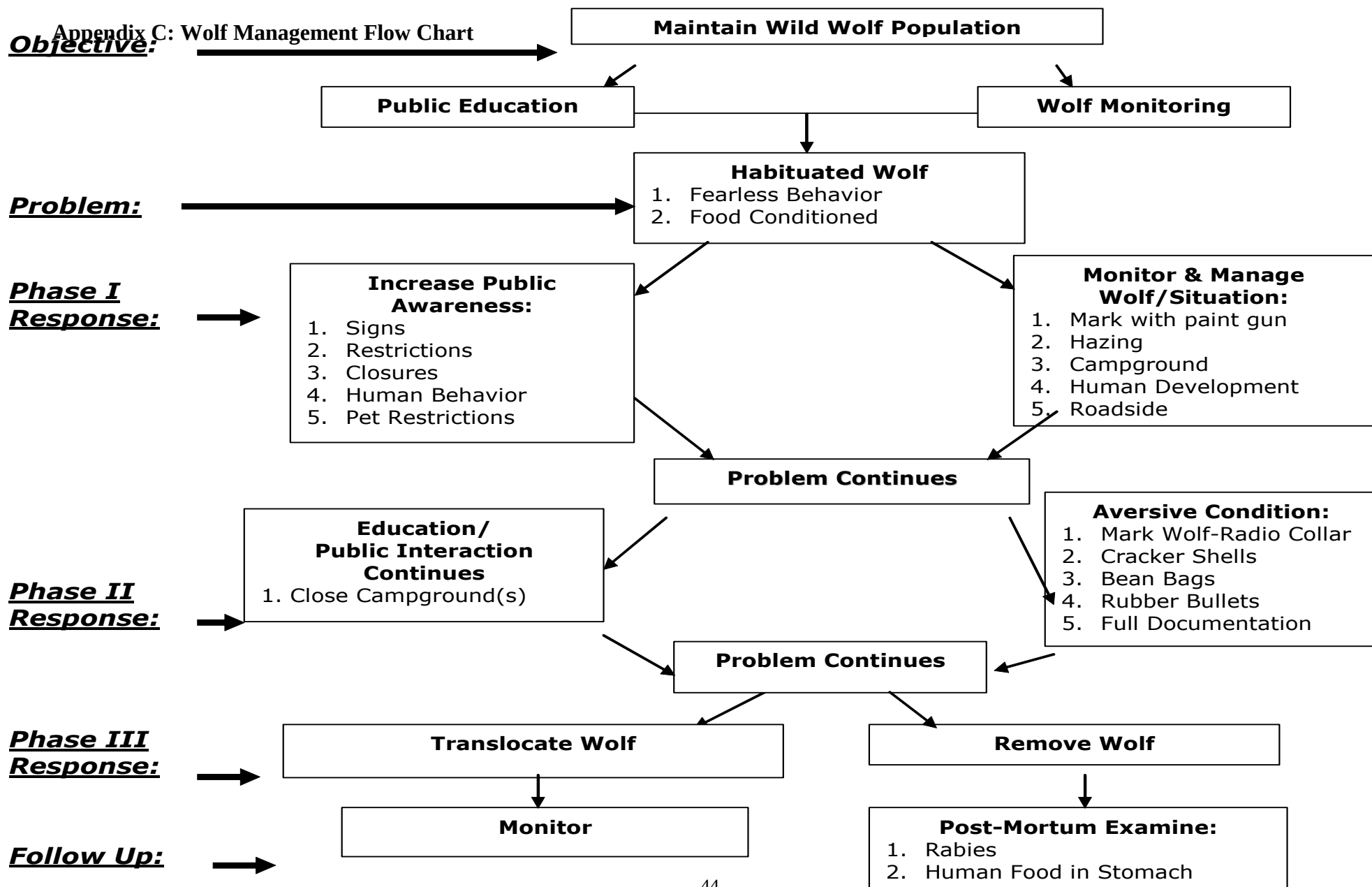


Appendix B: Management Option Matrix

	Behavior Category	Wolf-Human Interactions	Management Options
<i>Isolated Encounters</i>	Intolerant	Wolf leaves as soon as it is aware of people	None
	Tolerant	Wolves in area used by people; tolerates people nearby but ignores them and their facilities	Monitor
	Curious Interaction at less than 5 meters	Wolf shows inquisitiveness to identify a scent or object, then moves away	Monitor
	Mistaken Prey	Wolf investigates a human as if it was a prey species, but abandons upon recognition	Monitor
<i>Repeated Behavior</i>	Fearless	Wolf shows interest in people and/or property without fear of them or their actions, but the wolf's incident history is unknown	Mark with paint ball or radio collar & monitor; Haze or aversively condition Translocate
	Conditioned to people	Wolf shows repeat interest (i.e. close approaches) in people and/or their property, causes property damage	Mark with radio collar & monitor; Haze or aversively condition, Translocate
	Conditioned to campground	Wolf shows repeated interest in a frontcountry campground, approaches people and/or their property	Mark with radio collar & monitor; Haze or aversively condition, close campground, translocate or remove animal
	Rewarded – backcountry	Wolf obtains anthropogenic food	Close BC unit, mark & monitor, aversively condition
	Rewarded-frontcountry	Wolf obtains anthropogenic food in the frontcountry or roadside campground	Mark –radio collar, monitor, close CG, translocate or remove animal
<i>Other</i>			
	Defensive	Wolf responds aggressively to a human action or to defend a resource	Investigate & monitor
	Predation	Wolf attacks or kills a human	Remove



Appendix C: Wolf Management Flow Chart



Appendix D: Wolf-human Interactions History

1991

Encounters: 5 (2 Intolerant, 2 Curious, 1 Tolerant), (2 Backcountry, 3 Frontcountry)
Incidents: 11 (6 Fearless, 3 Curious, 1 Conditioned, 1 Prey Testing), (7 Backcountry, 4 Frontcountry)
Totals: 16 Interactions reported from 7 June 1991-11 August 1991
9 were in Backcountry, 7 were in Frontcountry
Humans aggressively dissuaded the wolves in 3 of the interactions (yelled, waved, threw rocks)
3 instances of wolves investigating property

1992

Encounters: 2 (1 Intolerant, 2 Curious), (1 Backcountry, 1 Frontcountry)
Incidents: 5 (4 Fearless, 1 Conditioned), (3 Backcountry, 2 Frontcountry)
Totals: 7 Interactions reported from 3 June 1992- 29 July 1992
4 were in Backcountry, 3 were in Frontcountry
Humans aggressively dissuaded the wolves in 3 of the interactions (yelled, waved, threw rocks)
2 instances of wolves investigating property

2000

Encounters: 8 (4 Curious, 2 Tolerant, 2 Conditioned), (6 Backcountry, 2 Frontcountry)
Incidents: 11 (8 Conditioned, 2 Fearless, 1 Mistaken Prey), (6 Backcountry, 5 Frontcountry)
Totals: 19 Interactions reported from 27 May 2000-12 August 2000
12 were in Backcountry, 7 were in Frontcountry
Humans aggressively dissuaded the wolves in 4 of the interactions (yelled, waved, threw something)
7 instances of wolves investigating property

2001

Encounters: 41 (7 Intolerant, 7 Curious, 16 Tolerant, 11 Conditioned), (27 Backcountry, 14 Frontcountry)
Incidents: 16 (14 Conditioned, 1 Curious, 1 Prey Testing), (6 Backcountry, 10 Frontcountry)
Totals: 57 Interactions reported from 30 April 2001-15 September 2001
33 were in Backcountry, 24 were in Frontcountry
Humans aggressively dissuaded the wolves in 10 of the interactions (yelled, waved, threw something)
7 instances of wolves investigating property

2002

Encounters: 37 (2 Intolerant, 3 Curious, 14 Tolerant, 11 Conditioned), (18 Backcountry, 19 Frontcountry)
Incidents: 4 (4 Conditioned), (1 Backcountry, 3 Frontcountry)
Totals: 41 Interactions reported from 30 April 2001-15 September 2001
19 were in Backcountry, 22 were in Frontcountry
Humans aggressively dissuaded the wolves in 14 of the interactions (yelled, waved, threw something)
1 instances of wolves investigating or damaging property



2003

Encounters: 26 (4 Indeterminate, 12 Intolerant, 8 Tolerant, 2 Curious)
Incidents: 2 (2 Curious)
Totals: 28 Interactions reported from 19 April 2003 to 8 Sept 2003
Humans aggressively dissuaded the wolves in 3 interactions (yelled, waved, threw something)
No Instances of property damage or investigation reported

2004

Encounters: 22 (6 Intolerant, 11 Tolerant, 4 Curious, 1 Fearless)
Incidents: 6 (6 Curious)
Totals: 28 Interactions reported from 19 May 2004 to 8 Sept 2004
Humans aggressively dissuaded the wolves in 6 interactions. (yelled, waved, threw something)
8 instances of wolves investigating or damaging property

2005

Encounters: 29 (9 Intolerant, 9 Tolerant, 5 Curious, 6 Conditioned), (17 Frontcountry, 12 Backcountry)
Incidents: 2 (2 Conditioned) (2 Backcountry)
Totals: 31 Interactions reported from 11 May 2005 to 10 Sept 2005
Humans aggressively dissuaded the wolves in 3 interactions (yelled, waved, threw something)
5 instances of wolves investigating or damaging property

2006

Encounters: 34 (12 Intolerant, 7 Tolerant, 7 Indeterminate, 7 Curious, 1 Fearless), (12 Frontcountry, 22 Backcountry)
Incidents: 4 (3 Curious, 1 Conditioned), (2 Frontcountry, 2 Backcountry)
Totals: 38 Interactions reported from 27 May 2006 to 1 Oct 2006
Humans aggressively dissuaded the wolves in 5 interactions. (yelled, waved, threw something)
10 instances of wolves investigating or damaging property

2007

Encounters: 28 (5 Intolerant, 7 Tolerant, 4 Indeterminate, 5 Curious, 2 Fearless, 5 Conditioned), (13 FC, 15 BC)
Incidents: 2 (2 Fearless), (1 Frontcountry, 1 Backcountry)
Totals: 30 Interactions reported from 16 April 2007 to 7 Sept 2007
Humans aggressively dissuaded wolves in 4 interactions. (Yelled, waved, threw rocks)
4 instances of wolves investigating property



Appendix E: Training Guidelines

Thorough training in aversive conditioning techniques, the use of firearms, immobilization agents, free-darting, and aerial capture is mandatory before employees are permitted to participate in the respective activity.

Firearms

The use of firearms for wolf and bear management purposes shall follow guidelines as listed in NPS-44, Resource Management Qualifications. The primary purpose for issuance of a weapon to Wildlife Management personnel is for protection of the visitor in case of animal attack, or for disposal of animals. Secondly, the weapon is available for personal protection in case of animal attack, during management actions, and patrolling of areas closed for kill sites. Unless otherwise stated in this plan, on lands within the boundaries of Denali National Park and Preserve, a wolf will be killed only if it presents a critical and immediate threat to human safety and after all other means of deterrence have been exhausted.

Immobilization

The following minimum qualifications are required for employees immobilizing wolves:

1. Successful completion of a 24 hour wildlife immobilization class covering the following topics: drug pharmacology, wildlife reactions to drugs, human and wildlife safety, wildlife handling ethics, monitoring immobilized animals, loading of darts, dosage calculation, drug handling, and equipment familiarization.
2. Field experience participating in supervised captures/immobilization (amount of time to be determined by the overseeing supervisor based on the trainee's prior experience and aptitude).

Aerial Capture

In addition to the qualifications mentioned above, employees involved in the aerial capture of animals must meet the qualifications specified in the Interdepartmental ACETA (Aerial Capture, Eradication and Tagging of Animals) Handbook.



Appendix F: Interviewing Suggestions and Forms

INTERVIEWING SUGGESTIONS

Try to obtain the following information using the forms and guidelines outlined in this appendix when interviewing a person who has been involved in a wolf-human interaction.

Use a Wolf Encounter Form (WEF) as an outline for your interview.

Get the most precise location of the interaction. Question the person about details (i.e. how long did it take to walk to the site, landscape features in the immediate area, points from which the site might be visible). Remember the information gathered from this interview may provide the only directions to the site of the interaction. Be alert for inconsistencies in time, distance and topography. People unfamiliar with the area are often very confused about exact locations, so clarify this with questions from different angles. Work with a map and your knowledge of the area.

Get a good description of all the actions and reactions that took place before, during and after the interaction. Emphasize times, distances, physical setting, vegetation, wind direction, etc, in your questioning. What did the wolf do? What did the people do? What did the wolf do next? What did the people do next?

What is the current situation? When the people left camp was the wolf still in the area? Is a dropped pack still in the backcountry? Are the tent and food still at the site?

Did the wolf obtain food? How was it stored? Are you sure the container lid was properly fastened? You need to be specific.

Who was involved? Get addresses, but also try to find out where people involved in the incident might be staying for the next few days and how they can be contacted.

What type of prior information from the park did the people involved receive about wolves? Were they given verbal and written information? Did they see signs? Did bus drivers, backcountry rangers, or interpreters advise them of current wolf activities or closures?

Covering these points completely in conjunction with a WEF should provide the critical initial information required for determining what management responses might be necessary.

WEF INSTRUCTIONS

1. Carry a few WEFs at all times.



2. Fill in all sections, except those marked "management use".
3. Use WEF for all:
 - a) Wolf-human interactions when people are on foot and the wolf is aware of them
 - b) Property damage, injury, food and garbage incidents, including a wolf unsuccessfully trying to get into a garbage can or vehicle.
 - c) Observations of wolves seen within 0.4 km (1/4 mile) of developed areas (campgrounds, visitor centers, building complexes).
 - d) Wolf handling and management actions.
4. Observations from vehicles farther than 0.4 km from developed areas do not need to be reported on WEF. Observations made away from vehicles do not need to be on WEF if the wolf was apparently unaware of the people. Observations inappropriate for WEF can be described on index or natural history cards. These are especially important if the observation is unusual, such as predatory activity, wolves with pups, or several wolves seen in one area on one day.
5. Do a separate WEF for each separate interaction (incident, encounter, observation, or control). For example, if a wolf damages tents in 2 campground sites in one night, two separate WEF should be completed.
6. Management actions- Use the same Case Incident Number for all controls related to a particular wolf.
7. Give WEFs to Wildlife Management Technicians promptly.
8. Wildlife Management Technicians will enter WEF data into the WEF database.

Case Incident Form #10-343 will be completed for all incidents involving an injury or property damage. The 10-344 can also be used to record additional narrative information for WEF report. Copies of all these forms should be attached to the corresponding WEF. Give forms to supervisor and Wildlife Management Technicians promptly.



Wolf Encounter Form – Denali National Park & Preserve

We are collecting information about how wolves and humans interact at Denali National Park and Preserve. Use this form only if you have had or have seen a close interaction with wolves. Your assistance is appreciated and will help us manage the park better for both the wolves and human visitors.



1. PEOPLE INVOLVED

Observer: _____ Date (m/d/yy): _____ Time: _____

Address: _____ City: _____ State: _____

Country: _____ Group Size (number of people that encountered the wolf/wolves): _____

2. GROUP TYPE

- A. Park Visitor
- B. Concession Employee
- C. NPS Employee
- D. Professional Photographer
- E. Contractor/Researcher
- F. Kantishna Resident/Employee
- G. Mountaineer/Climber

3. VISITOR ACTIVITY

- A. Backcountry camping
- B. Bicycling
- C. Dayhiking in backcountry
- D. Walking on road
- E. Driving on road
- F. Camping – developed campground
- G. Other _____

4. LOCATION OF ENCOUNTER: _____

A. Backcountry Unit Number: _____ (or) Park Road Mile #: _____

- B. Developed Area:
- | | |
|-------------------------------------|--------------------------------|
| a. Riley Creek Campgroundm. | m. Teklanika Campground |
| b. Riley Creek Mercantile | n. Teklanika Rest Area |
| c. RR Depot | o. Igloo Creek Area/Campground |
| d. VC | p. Polychrome Rest Area |
| e. Concessionaire Housing | q. Eielson Visitor Center |
| f. C-Camp | r. Stony Hill Overlook |
| g. Headquarters Area | s. Wonder Lake Campground |
| h. Savage Campground | t. Toklat Roadcamp |
| i. Sanctuary Campground | |
| j. Kantishna Developed Areas: _____ | |
| k. Wonder Lake Day Use Area: _____ | |
| l. Other Locations: _____ | |

5. WHAT WERE YOU DOING WHEN YOU SAW THE WOLF/WOLVES?

6. TOTAL NUMBER OF WOLVES SEEN: _____

7. DESCRIPTION OF WOLVES

#1	#2	#3	#4	#5	#6
a. white	a. white	a. white	a. white	a. white	a. white
b. black	b. black	b. black	b. black	b. black	b. black
c. gray	c. gray	c. gray	c. gray	c. gray	c. gray
d. tan	d. tan	d. tan	d. tan	d. tan	d. tan

Other identifying marks (collars, etc.): _____ (OVER) →



8. WHAT WAS THE CLOSEST DISTANCE BETWEEN YOU AND THE WOLF? (in meters)

9. DID THE WOLF/WOLVES APPROACH YOU? Yes No

10. WHAT WAS THE WOLF/WOLVES DOING?

- | | |
|---------------------------|-----------------------------|
| a. Alert at den | h. Running from people |
| b. Mating | i. Running toward people |
| c. Feeding on carcass | j. Standing |
| d. Hunting | k. Traveling |
| e. Investigating property | l. Walking away from people |
| f. Playing | m. Walking toward people |
| g. Resting | n. Other: _____ |

11. HOW DID YOU REACT TO THE WOLF?

- | | |
|---|--------------------------------|
| a. Abandoned Property | g. Photographed Wolf |
| b. Backed away/made noise | h. Ran Away |
| c. Continued hiking in the same direction | i. Remained still/quiet |
| d. Followed the wolf | j. Threw something at the wolf |
| e. Made Noise | k. Walked away/Backed away |
| f. Other: _____ | |

12. DID THE WOLVES GET HUMAN FOOD OR GARBAGE? Yes No

13. DID THE WOLF/WOLVES DAMAGE GEAR OR BELONGINGS? Yes No

If yes, what?

14. PLEASE DESCRIBE IN MORE DETAIL THE WOLF-HUMAN INTERACTION:

15. REPORT COLLECTED BY: _____ (NPS Staff)

MANAGEMENT USE ONLY

1. Record #: _____

2. Case Incident: _____

3. UTM East:

UTM West:

Entered By: _____

4. Wolf Behavior

- | | |
|----------------|------------------|
| A. Intolerant | G. Prey Testing |
| B. Tolerant | H. Defensive |
| C. Curious | I. Mistaken Prey |
| D. Fearless | J. Rabid |
| E. Conditioned | K. Depredation |
| F. Rewarded | L. Indeterminate |

6. Additional Comments

5. Management Rating

- | |
|--------------------------|
| A. Observation |
| B. Encounter |
| C. Incident; general |
| D. Incident; gets food |
| E. Incident; prop damage |
| F. Incident; injury |



DENALI NATIONAL PARK AND PRESERVE WOLF MANAGEMENT

CONTROL ACTION

WEF data base record #:

Date

Time

Location (include UTM:

Description of wolves:

People directly involved:

Describe the initial situation:

Type of Action (circle): Hazing Aversive Conditioning shock collar Euthanasia

	# Hits	# Miss	# Unknown	Distance
Cracker Shell				
Rubber Slug				
Bean Bag Round				
Rifled Slug				
Pepper Spray				
Paint Pellet				
Other				

Describe control action and wolf's reaction:

WEF Record # of previous control actions involving this wolf(s):

Did the wolf(s) return to the area after this control action? Y N

WEF Record #(s) of subsequent control actions involving this wolf:



Appendix G: Wolf Encounters Educational Materials:



HIKING AND CAMPING WITH WOLVES

Help keep wolves wild and people safe by following these guidelines



Never approach a wolf, or other wild animals. Do not allow it to approach you. Maintain a 1/4 mile (400 meter) distance from any wolf you see. Anticipate the likely travel patterns of wolves you observe and adjust your travel plan to avoid them. Approaching wolves or allowing them to approach you can lessen their natural wariness of humans and reinforce unnatural fearless behavior.



Do not feed or encourage wolves to approach or linger around you or your campsite for any reason. Such actions increase the chances that wolves will become fearless of people and can result in future problems.



Closely attend to children in campgrounds, on trails, and along river bars. Wolves (and bears) may be more curious and less intimidated by children. Children's fast and unpredictable movements may elicit a predatory response in wolves. Children should never be allowed to walk dogs alone.



Maintain a clean camp. All food, cooking utensils and personal belongings must be properly stowed. Never leave food, trash or personal belongings, including shoes and sandals, unattended at your campsite. Wolves are naturally curious and attracted to novel odors and items associated with people.



Pets may attract wolves and should not be left unattended. Pets are not allowed on trails, river bars or in the backcountry. Dogs on a leash are allowed only on the park road, in campgrounds and parking areas. Never leave dog food out. Tie your dog up at your campsite only when you are present. Pets must be left inside a vehicle while you are out in the park.



When traveling the park road on the bus, stay quiet if wolves are near. Don't hang out of windows or drop food or other objects for them. If in your own vehicle, follow the same rules and stay inside.

If a wolf approaches you or acts unafraid or, take the following actions

If a wolf approaches you:



- **Raise your arms, flare your coat to look bigger, and group together if with others.**
- **Make loud noises by shouting, clapping your hands, and banging pots and pans when the wolf is still at a distance.**

If the wolf continues to deliberately approach, stand your ground and continue the above. If the wolf is still undeterred throw objects such as sticks or rocks at the wolf, strike the wolf with a large stick or pole if one is available, and/or use pepper spray if you have it.



It is extremely important to give any wolf that approaches a person the message that they will not be tolerated in close proximity. Allowing a wolf to approach or linger may ultimately result in injury as well as the wolf's removal. Please act responsibly!



Never run or turn your back on a wolf or a bear. Running may trigger a predatory response. **Never 'play dead' during an encounter with a wolf.**



Wolves that are fearless of people and willing to approach closely are unlikely to show the behaviors we normally associate with aggressive dogs, such as growling, raised hackles, or bared teeth, even before an attack.



The risk of being attacked by a wolf is extremely low. But if an attack does occur, fight back using your fists, a chunk of wood, rocks, or pepper spray. Concentrate your blows on its face and snout.

Report any encounter with wolves to a Park Ranger, Campground Host, or to a Visitor Center as soon as possible.



The Wolves of Denali National Park and Preserve

Denali National Park is fortunate to be one of few places in Alaska, or the world, where people have the chance of viewing gray wolves, without the cost and logistics of accessing remote wilderness regions of the wolf range.

Between 12 and 18 packs roam Denali in territories that range from 200 to 800 square miles. These packs are strong social units whose core are the alpha male and female wolf and their offspring. The average pack size is six to eight wolves, though one was once recorded at 29 members.

The wolf pack works as a team to hunt, to protect, and to raise the spring's pups. A wolf may travel ten hours a day to find the five to ten pounds of meat it needs daily. Packs vary in size and territory every year, and thus are seen in different parts of the park on a regular basis.



Although wolves are powerful and capable predators, they are not naturally aggressive or dangerous to people. In fact, in North America, there are only 18 cases of wolf attacks on people since 1969 and no documented fatalities. Domestic dogs, on the other hand, are responsible for 4.7 million bites and a dozen fatalities each year.

Although the risks of a wolf biting or attacking someone are extremely low, wolves that lose their fear of humans may approach people or camping areas which increases the possibility of an attack. Further, such "fearless" wolves are unlikely to show the behaviors we normally associate with aggressive domestic dogs, such as growling, barking, or raising their hackles. When dealing with wolf-human encounters it is essential to remember that although wolves resemble dogs, they are large predators (like grizzly bears) that can pose a serious threat to human safety. A curious wolf may be attracted to campgrounds, which can quickly become a problem if the wolf acquires food or if its tolerance of people increases.

In order to preserve this naturally regulated wolf population, it is very important that people follow the rules on the other side of this brochure to ensure that wolves continue to act as nature intended and are not attracted to people or their camps.

Why is there concern about wolves in Denali?



Wolves are naturally curious but wary animals, normally staying away from areas of human activity. However, in recent years several wolves have displayed increasingly bold and sometimes "fearless" behavior in Denali. Wildlife managers use the term "fearless" to refer to wolves that have become comfortable with human activity, acting bold, curious, and undaunted by human presence. Fearless wolf behavior can develop when wolves frequently encounter people without negative reinforcement. Reports in Denali of fearless wolves include wolves that approached or followed people, took items such as shoes and packs, investigated tents, and showed unusual interest in areas frequented by humans.

While no wolf has displayed aggressive behavior toward humans in Denali, similar behavioral patterns in Canadian parks have led to aggression and attacks. The Park's objective is to prevent this behavior progression by taking preventative measures and by informing park visitors.

Why should I work to prevent wolf encounters?

The risk of being attacked by a wild wolf is extremely low, and fear of wolves should not keep anyone from spending time in areas inhabited by wolves. There are no accounts of wolves attacking people in Denali, and only a few accounts in North America. However, wolves are wild animals and should be treated as such.

Fearless wolf behavior is safe neither for Denali's visitors nor for its wolf packs. Wolves are an integral part of Denali's wilderness ecosystem, and a healthy respect and distance is required between all wild animals and human beings.



All About Wolves in Denali National Park and Preserve

Keeping Up With the Pack in Denali

With about 100 wolves covering terrain in 6-million-acre Denali National Park and Preserve, you just might see one — maybe even a whole pack.

Odds are best along the first 50 miles of road past the park's entrance, a section that traverses the territories of two packs, the Mount Margaret and the East Fork (also known as the Toklat).

To spot members of the Mount Margaret wolf pack, keep your eyes peeled along the first 14 miles of the park road. Be on the lookout for members of the East Fork pack between the Teklanika campground

and the Toklat River. Although these packs are used to the presence of humans, park visitors can create problems for them and other wolves through actions that interfere with a wolf's natural wild behavior. Feeding wolves or allowing them to approach closely can reduce their natural wariness of people, which can lead to fearless behavior.

In recent years, wolves have been seen in and around Denali's Teklanika and Igloo campgrounds. This prompted park officials to close Igloo, a small walk-in campground, and to prohibit tent camping at Teklanika in 2002.



Glimpsing an Elusive Predator

By Joel Bennett

I am always astonished at how wolves seem to appear out of nowhere in the wilds of Alaska. From an empty horizon or the edge of an endless winding river course, all of a sudden they are there, instantly energizing the landscape.

One day near Primmrose Ridge in Denali, I was filming a grizzly bear mother and her cub feeding on berries in heavy brush. The cub began acting nervously. The mother bear charged. In a blur of activity, an adult wolf burst from the brush followed by the massive grizzly in close pursuit. In a split second it was over. The two bears were together again, and the wolf had disappeared.

Another time, farther north, a band of caribou with newborn calves fanned out into a clearing in front of the camera. I noticed one skittish cow in the

lead moving forward, cautiously stopping and starting and looking from side to side. Somehow I had failed to see a lone wolf that had been stalking the animals from a sparse line of willow shrubs paralleling their route. The wolf raced into the open and within seconds careened into the frightened herd, seizing a fleeing calf. It all took less than a minute.

As you pass through Denali, remember that casually looking around for wolves is not enough. Concentrate intensely. Look hard out at the same piece of land for a time. Then look again. There's a wolf out there somewhere. Sooner or later you will see it.

Joel Bennett is Defenders' Alaskan representative and an accomplished wildlife filmmaker and photographer.

FOR WOLF WATCHING RULES, SEE PAGE 3.

WELCOME TO DENALI WOLF TRACKER

Denali Tracker is a collaboration of the National Park Service and Defenders of Wildlife, a national nonprofit conservation group long involved in wolf conservation and recovery. Its purpose is to educate visitors about the wolves of Denali National Park and Preserve and to encourage responsible and rewarding wolf viewing in the park. For more information on Defenders of Wildlife, visit www.defenders.org.

Denali Tracker is funded by the Wendy P. McCaw Foundation and compiled by Joel Bennett and Karen Deatnerage.

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Alaska's Wolves: Something to Howl About

Alaska—it's a land where the caribou population outnumbers the people and where vast stretches of wilderness remain pristine. It's also the only state in the union where wolves still thrive and don't need protection under the Endangered Species Act.

Estimated at some 7,500 to 10,000 animals and covering more than 85 percent of the state, Alaska's wolf population is distributed among several hundred packs. Wolf numbers vary geographically, generally in accor-



PHOTO BY JOEL BENNETT

dance with the abundance of their ungulate prey. While wolves still face many human pressures, they have a reputation for adaptability and survival—if ample food and suitable wild habitat are available.

PACKING IT IN

In Denali National Park, the wolf population fluctuates from year to year but averages about 100 wolves in 12 to 23 packs, or family groups. Packs, which are usually named for a river, moun-

tain or some other prominent geographic feature within their territory, vary in size from two to nearly 30 members in Denali.

Each pack defends a territory that can cover from 200 to 800 square miles. Wolf packs are found throughout the park but most occupy the northern two-thirds where broad glacial river valleys provide plenty of food for moose and other prey. Some packs, such as the ones found on the Herron River or in the northern Kantishna Hills, are rarely encountered by visitors. Others, such as the Mount Margaret and East Fork packs near the park's eastern end, are seen frequently. Some Denali wolves also travel outside park borders.

Wolf packs are well-organized families. Typically there is only one breeding pair called the alpha male and female. Their pups are born in spring and are cared for by all family members until they become independent in the fall.

Packs are forever changing. Juvenile wolves typically leave the group to form new packs or to join other packs, and roughly 30 percent of wolves under the age of three disperse into territories outside the park each year. Entire packs may die out, but their territories are reoccupied by new packs formed by dispersers or neighboring packs.

Wolves communicate closely, using body language, scent marking and howling. In packs, they work as a team to hunt and defend their territories against threats from other wolves.

IN PURSUIT OF PREY

Almost any animal is fair game, but moose, caribou and Dall sheep are the mainstays of the wolf's diet in interior Alaska. Of the smaller mammals available, beavers, hares, marmots and ground squirrels are often eaten by wolves. Wolves follow the daily and seasonal movements of the large prey animals, sometimes traveling more than 100 miles a day.

Moose are by far the largest prey animals pursued by wolves in Denali. At present, they are moderately plentiful, numbering more than 2,000.

Weighing in at 1,000 pounds or more, an adult moose is difficult to kill and can require several days of pursuit, but it will feed an average size wolf pack for many days. To have such a feast, wolves risk injury and use all the resources of the pack to make the kill.

With an average weight of 275 pounds, caribou are the second most preferred prey species for Denali's wolves. The Denali caribou herd, which has fluctuated from 1,000 to more than 3,000 animals during the past 25 years, currently numbers about 1,750. In summer, caribou are scattered throughout the alpine tundra in the Alaska Range and its foothills. In the winter, they are found in the lower elevation tussock tundra and spruce woodlands across the northern reaches of the park. The herd moves through the central and western sectors of the park seasonally, feeding on lichens and



other vegetation. Wolves pursue newborns on the caribou calving grounds and look for older bulls worn down by fights during the fall mating season. In the winter, if more caribou than needed are killed, wolves return repeatedly to feed on the frozen carcasses.

The wolf's third mainstay, Dall sheep, are mountain animals that are especially vulnerable if caught off their terrain. They are smaller than caribou and moose — usually less than 140 pounds — but with about 2,000 sheep in the park, they are a regular food source for the packs that cover their range.

As wolves and their prey interact, other carnivores come into play. The wolf's foremost adversary is the grizzly bear, which competes for food as both a hunter and scavenger. Conflicts over moose are most frequent, but bears are wide-ranging and encounter wolves near dens and around other kills. The carcasses of animals killed by wolves also provide meat for scavengers such as foxes, coyotes, wolverines, martens and ravens.

THE BENEFITS OF WOLVES

Wolves are an essential component of healthy ecosystems. Without wolves and other top predators and the complex predator-prey relationships that have evolved over thousands of years, biodiversity would be lost.

Although wolves do take healthy prey, they tend to kill the most vulnerable animals — the young, the old, the injured or the sick.

The removal of these weaker individuals may decrease the competition for food among the healthier prey animals that remain. The same principle applies to wolves: Wolves that are sick, injured, weak or slow to master hunting skills either die or disperse. Over many generations, this helps prey and predator alike become better adapted for survival.

Close Encounters of the Wolf Kind

Keep Denali's legendary wolf packs wild!
Follow these rules.

WOLF WATCHING RULES

- Please don't feed the wolves! Don't use food or other enticements to encourage wolves to stay near a campground or viewing area for photos or other reasons. Feeding wild animals makes them dependent on humans and can lead to fearless behavior. It is also against the law and punishable by a \$150 fine.
- When traveling the park road on the bus or in your vehicle, stay inside and keep quiet. Don't hang out of the windows or throw food or objects out of them.
- If you are traveling on foot or by bike, don't approach any wolf or allow it to approach you within a quarter mile. Getting too close to wolves can lessen their natural wariness of humans and reinforce fearless behavior.
- If a wolf approaches you, don't turn your back on it or run away. Back away slowly. Wave your arms, stomp your feet and yell, bang pots and pans or make other loud noises.
- If you are camping, maintain a clean campsite and don't allow wolves to approach. Don't leave food, trash or personal belongings unattended. Wolves are naturally curious and attracted to human odors and objects; don't entice them and get them used to the presence of humans.
- Don't leave pets unattended. Walk dogs only on the park road or within campgrounds or parking areas and dispose of their waste properly.
- Report any encounters with wolves to the nearest park ranger, or go to one of the two park visitor centers and fill out a "wolf encounter form."



ILLUSTRATION BY J. O. MOORE

Denali Wolf Tracker

The “First Family” of American Wolves

If you take the bus into Denali National Park, the driver will likely point out a small cabin overlooking the braided waters of the East Fork River. This is the cabin used by biologist Adolph Murie, who was commissioned by the National Park Service in the late 1930s to study the impact of wolves on the park's Dall sheep.



ADOLPH MURIE'S CABIN BY JILL BENNETT

Armed with pencil, notebook and compass, Murie closely observed wolves in the East Fork area of the park and produced *The Wolves of Mount McKinley*, the first published study of wolves in the wild. In this landmark work,

Murie noted that wolf packs are basically families and that for every successful attempt at taking prey, wolves make many unsuccessful ones. He concluded that the East Fork wolves usually preyed on the most vulnerable Dall sheep: lambs and old or debilitated adults.

Remarkably, Murie presented his findings in a way that appealed to scientists and laymen alike. According to Alaska historian Timothy Rawson, with the publication of Murie's study in 1944, Denali's East Fork wolves and their offspring “became the ‘First Family’ of American wolves, delighting many thousands of readers and visitors.”

Research on Denali's wolves continues. Throughout the park, aircraft, radio telemetry, molecular genetics and biochemistry are being used to gather data to further our understanding of the ecology of gray wolves and their prey in the Denali ecosystem.

Look for Murie's classic study and other books about Denali's wolves, such as *The Wolves of Denali* by L. David Mech and “Changling Tracks” by Timothy Rawson, at the Denali visitor center bookstore.

Fast Facts About Wolves

Appearance: Denali's wolves belong to the species known as gray wolves (*Canis lupus*), although they can be gray, tan, brown, black or white. Their eyes are yellow or greenish-brown. Adult wolves stand 26 to 32 inches at the shoulder. The average weight is 87 pounds for an adult female, 100 pounds for an adult male.

Food: Wolves are carnivores. They eat mainly meat. Their prey consists of caribou, moose, Dall sheep and sometimes beaver, snowshoe hare and ground squirrels.

Social Structure: Wolves are social creatures. In Denali, packs or family groups have ranged from two to 29 wolves, but usually are made up of five to eight animals. A typical pack includes a breeding pair of adults, three or four pups born in mid-May and possibly a couple of older offspring. Adult pack members work together to hunt and care for the young.

Communication: Wolves communicate through facial expressions and body postures, scent markings and a wide range of vocalizations including barks, whimpers, growls and howls.

Lifespan and Mortality: Wolves in Denali may live as long as 12 years, but less than half make it to their third birthdays. Most wolf deaths in the park result from confrontations with neighboring packs. Wolves also die from starvation, disease, accidents, injury and old age. Subsistence hunting and trapping are allowed in some areas of Denali National Park and Preserve. General trapping and sport hunting are allowed on the state lands bordering Denali with the exception of a 125-square-mile buffer zone outside the eastern end of the park that helps protect the East Fork and Mount Margaret packs when they leave the park to hunt.

To find out more about wolves, check out the following Web sites:
www.nps.gov/denali www.defenders.org

The Big, Bad Wolf: Fact vs. Fiction

Remember the fairy tale of Little Red Riding Hood and how the wolf ate her grandmother? Here's the true story: There's no such thing as the big bad wolf. Wolves are not naturally aggressive or dangerous to people. In fact, in North America there have been only 18 reported wolf attacks since 1969 and no documented fatalities. Domestic dogs, on the other hand, are responsible for more than 4.7 million bites and a dozen fatalities a year.

Wolves are wild animals and behave quite differently than their domesticated relatives. For example, unlike Spot and Rover, wolves usually do not show aggression by growling, barking or raising their hackles.

Wolves are naturally curious but wary animals and typically stay away from areas of human activity. In recent years, however, several wolves in Denali have displayed increasingly bold and sometimes fearless behavior. “Fearless” describes wolves that

have become comfortable enough with human presence and activity in the park to approach or follow people, take shoes and backpacks and sniff around tents.

Fearless behavior develops when wolves frequently encounter people and are encouraged to approach or rewarded with food. This behavior can lead to serious problems, so please follow the “Wolf Watching Rules” listed on page 3 and help keep Denali's wolves wild.

Appendix H: Protocols for Implementing Closures

PUBLIC USE CLOSURES RELATED TO RESOURCE CONDITIONS

Revised July 8, 2003

Introduction

Title 36, Code of Federal Regulations, Part 1.5 authorizes the Park Superintendent to establish public use closures in the interest of maintaining public health and safety, protecting environmental and scenic values, and protecting natural and cultural resources. Within the context of natural and cultural resources preservation and natural hazards management this closure authority most often extends to the following situations:

- Wildland Fires
- Hydrogeologic Events such as floods, mud/rockslides or earthquakes
- Severe Storms
- Wildlife Activity such as den/nest sites, prey kill sites, or areas near potentially hazardous animals

It should be noted that this is not a complete list of circumstances that can determine the establishment of a closure or use limit.

Closures and use limits are generally categorized as permanent or non-permanent. The primary distinguishing feature between the two is the anticipated duration of the use limit. **This directive deals solely with non-permanent closures and is separated into sections dealing with EMERGENCY and TEMPORARY closures.**

EMERGENCY CLOSURES

Emergency situations are recognized to immediately threaten public health and safety and will not last longer than 30 days. These closures may not be extended.

Recommendations for emergency closures related to resource conditions are expected to originate from field rangers and field resource management staff.

Procedures:

1. Determine that a closure is necessary. DO NOT proceed to implement a closure on hearsay.
2. Field rangers should make a reasonable attempt to contact their Subdistrict Ranger and field resource management staff should make a reasonable attempt to contact the Wildlife Biologist or their supervisor. Supervisory individuals will make recommendations on how the closure will be



designed, implemented and terminated. Supervisory individuals will then contact the Superintendent or acting superintendent for approval (and signature). The Communication Center will maintain a schedule of who has acting Superintendent authority during the Superintendent's absence.

Normally these contacts would not be made between 10PM and 7AM. If, however, the circumstances are serious enough, contacts should be made at any hour at the discretion of the field staff.

3. If the Subdistrict Ranger and/or the Wildlife Biologist are not available, field employees will contact the Superintendent and or the Acting Superintendent and make the recommendation for emergency closure. The Superintendent or Acting Superintendent will make the determination that a closure is needed. **If no contacts can be made (Comm. Center closed or no radio contact) and field staff determines the closure is necessary for human safety, proceed with signing the closure. Field staff will make the appropriate closure at the earliest opportunity.**

4. Once the Superintendent or Acting Superintendent approves a closure, notify the Communication Center. Be prepared to provide the following information: requestor, place name for the closure (assigned by the field staff), purpose and justification, location, and description of the perimeter. A map will be prepared and provided to the Communication Center as soon as possible after the determination to implement a closure.

5. The Communication Center will be responsible for assigning a closure number, preparing a closure notice, and advising all parties identified on the Notification List below.

6. Proceed with the closure by posting the appropriate signs.

7. Prepare a written Case Incident Report Form (SF-344), and have the Superintendent or his designee sign it. Then process it with the Communication Center. Include a map or diagram of the closed area and source point (kill site, etc.). Case Incident Reports should follow the format provided below.

8. Immediately following receipt of the Case Incident Report, the Communication Center will forward it to the Superintendent and the Chief Ranger.

9. The Wildlife Biologist and/or the Field Ranger will coordinate the monitoring and subsequent opening of the closure. Determination of this responsibility will be made during Step 2 above.

10. Openings (See Opening Procedures below)

TEMPORARY CLOSURES (These closures are non-emergency in nature)

Non-emergency situations do not pose an immediate threat to public health or safety but focus on preservation of park resources or may be implemented to expedite park operations. These closures will not last longer than 12 months and may not be extended.



Recommendations for non-emergency closures related to resource conditions are generally expected to originate from District and Subdistrict Rangers, Maintenance Foremen, Division Chiefs, and employees within the Center for Resources, Science and Learning. On occasion, cooperating investigators may submit closure proposals.

Procedures:

1. Contact the Wildlife Biologist prior to preparing a recommendation to avoid duplication of effort.
2. Recommendations for all non-emergency wildlife related closures are to be submitted to Wildlife Biologist in writing.

The written recommendation will be submitted on a Case Incident Report Form. Include a map or diagram of the closed area and source point if possible (fox den, etc.). Case Incident Reports should follow the format depicted below. Please be specific regarding the geographic locations and the justification for the action. The originator is responsible for assigning a place name to the closure recommendation and for receiving a Closure Number from the Communication Center.

3. Recommendations will be forwarded to the Director, Center for Resources, Science and Learning who will submit them to the Superintendent (copy to the Chief Ranger) for consideration and signature.
4. If the Superintendent concurs, the signed Case Incident Report will be forwarded to the Communication Center. This report will include maps and/or geographic descriptions of the area(s) to be closed. The Communication Center will forward a copy of this report to the Director, Center for Resources, Science, and Learning and the Wildlife Biologist.
5. The Communication Center will be responsible for advising all parties identified on the Notification List. The Wildlife Biologist will be responsible for updating the master map, and for making the map available to parties on the Notification List.
6. If the Superintendent rejects the recommendation, the Director, Center for Resources, Science and Learning will be promptly advised. The Wildlife Biologist and staff initiating the closure proposal will also be promptly notified.
7. The Ranger Activities Division and the Wildlife Biologist will coordinate posting the area with appropriate signs per maps received from the Communication Center's signed copy of the Case Incident Report. It is important to realize that maps associated with original recommendations may not reflect what the Superintendent eventually agrees to. Consult final determination documentation. A minimum requirement / tool analysis for any signs posted within the Wilderness is required.



8. The Wildlife Biologist and the Ranger Activities Division will coordinate the monitoring and subsequent opening of the closure, providing regular feedback throughout the process. The ultimate responsibility for monitoring will rest with the Wildlife Biologist.

9. Openings (See Opening Procedures below)

OPENINGS

Openings of Emergency Closures are made only after a site has been physically inspected.

If employees are entering a potentially hazardous closed area, they are to advise the Communication Center of their entry and exit.

If a kill site is involved, two employees armed with shotgun(s) will be involved in the inspection.

Procedures:

1. Before entering a closure, individuals should confer with the Wildlife Biologist. The purpose of this consultation is to determine the appropriateness of the opening and whether additional information is required from the closure area.

2. Before opening a closure (and removing closure signs), the Wildlife Biologist will make a reasonable attempt to obtain oral or written concurrence from the Superintendent or Acting Superintendent. The communication center can facilitate this contact. If this concurrence cannot be obtained in advance and field conditions warrant, proceed with the opening.

3. Notify the Communication Center of all openings. The Communication Center will be responsible for advising all parties identified on the Notification List.

4. Oral recommendations for lifting closures are to be followed-up, as soon as possible, with a written Case Incident Report Form and processed with the Communication Center. These reports should follow the format provided for a closure opening recommendation. The Communication Center will forward a copy of this report to the Wildlife Biologist.

5. The inspecting party will be primarily responsible for removal of all signing. Coordination should occur between the Center for Resources, Science and Learning and the Ranger Activities Division to assure efficiency in sign removal.

Status of Closures

The Communication Center will maintain a running log and complete file of all closures and openings. A Closure Update Report will be completed by the Communication Center and distributed to all parties on the Notification List when closures change.



Maps

Backcountry Unit Maps

A Backcountry Unit Map, indicating minimum closure areas, will be prepared by April 15 of each year. The map legend will note in bold letters that only those areas so outlined and shaded are closed. Closure boundaries will be printed in such a fashion that they will not be confused with other features on the map. This map will also serve as the Backcountry Unit Map and will include narrative pointers regarding closures and travel around them. This map will serve as a master copy and will be maintained as part of the geographic information system in the Center for Resources, Science and Learning. The master will be updated as closure boundaries change throughout the course of the season. Copies will be made of the master, as updates occur, and will be supplied to all backcountry users. The Wildlife Biologist is responsible for original map preparation and subsequent closure boundary updates. This map will be available to the Backcountry Desk at any time and will be distributed to all parties on the Closure Notification List when closures change.

USGS Topographic Maps

When documentation for emergency closures or justifications for other temporary closures is prepared it should include a map (1:63,360) depicting closure boundaries. Once final closure determinations are made they should include similar maps (1:63,360) with approved closure perimeters. Copies of these maps will be maintained in the Communication Center, Center for Resources, Science, and Learning Files, and the Backcountry Desk for reference purposes.

A master set of these maps will be maintained in the Center for Resources, Science and Learning, which depict details of the boundary lines of each closure area. These masters will be updated as closure boundaries change throughout the course of the season and will be distributed to all parties on the Closure Notification List as closures change. Backcountry staff will have backcountry users consult the maps for familiarity with closure boundaries. These maps will also form the basis for field deployment of closure signs. The Wildlife Biologist is responsible for original map preparation and subsequent closure boundary updates.

Delegations of Authority

In the absence of Subdistrict Rangers, District Rangers, the Chief Ranger, the Wildlife Biologist, the Director Center for Resources, Science, and Learning, the Assistant Superintendent, or the Superintendent, those individuals who have delegated authority to act on their behalf will make decisions regarding closures and will take actions accordingly.

I concur with the above recommendations on implementing temporary and emergency closures for wildlife related resource conditions:

Superintendent: Paul R. Anderson

Date



Notification list

Persons and places to notify when a closure is put into effect

Upon notification the communication center will distribute the closure information to the following:

Public Information Officer
Backcountry Desk at Visitor Center
Half sheet notice is posted in headquarters at mailboxes
Superintendent's Secretary
Supervisory Wildlife Biologist
Wildlife Biologist
East District L.E. Rangers
West District L.E. Rangers
Interpretation staff conducting programs in or near affected areas
Morning report (via radio at 10am, reports are also distributed)
Joint Venture transportation (tundra wildlife tours)
Kantishna businesses (if appropriate)

A closure update sheet will be distributed as closures change. This sheet should be posted and accessible to all employees.

CASE INCIDENT REPORT SF-344
FORMAT FOR CLOSURE & OPENING RECOMMENDATION



U.S. DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE
SUPPLEMENTARY CASE/INCIDENT RECORD

ORGANIZATION (PARK) NAME Denali National Park and Preserve	CASE/INCIDENT NUMBER 030019
LOCATION OF INCIDENT Jenny Creek	DATE OF INCIDENT 05/01/03
NATURE OF INCIDENT Temporary Wildlife Closure	
COMPLAINANT'S NAME	COMPLAINANT'S ADDRESS

RESULTS OF INVESTIGATION

EFFECTIVE DATE: 05/01/03

CLOSURE NAME: Jenny Creek Closure

CLOSURE NUMBER: 001

JUSTIFICATION: The closure is necessary to protect a wolf denning areas. Wolves are currently active in the vicinity.

LOCATION: Signs are placed on the drainages and pullouts along the south of the park road, on the north boundary of the closure. See attached map.

PREPARATION: Acting Wildlife Biologist

POST AREA: East District Rangers and Wildlife Management Technicians

NOTIFY COMM. CENTER: Wildlife Management Technicians and East District Rangers

MONITORING: Wildlife Management Technicians

OTHER COMMENTS: Authority for temporary closures is found in Title 36, Code of Federal Regulations, Section 1330, (a). The area is posted with appropriate signs as prescribed in Title 36, CFR, Section 1330, (f) (2).

SUBMITTED BY (SIGNATURE AND DATE)

APPROVED BY (SIGNATURE AND DATE)



Appendix J. Wolf capture protocols

Wolves are captured to monitor the distribution, abundance, population dynamics, and predation behavior of the wolf population in and adjacent to Denali National Park. Wolves are also occasionally captured for management actions. To achieve these objectives we attempt to maintain 2 radio-collared wolves within each pack inhabiting the park north of the Alaska Range. We usually attempt to radio-collar the breeding adults in each pack because they are less likely to disperse than younger pack members, and their locations are more likely to reveal active den sites.

Most wolf captures occur during early and late winter when snow conditions and day length are amenable to field operations. Occasionally, wolves are captured opportunistically during other field efforts in spring and fall. Wolves are located by following tracks in the snow with a PA-18 Supercub or locating previously radio-collared individuals. All capture efforts utilize a Bell 206 Jet Ranger, Hughes 500, or Robertson R44 helicopter as a darting platform and to transport the processing crew. A PA-18 Supercub or similar aircraft is used to direct the helicopter to the wolves for capture, to monitor darted wolves until drug induction, and to check on wolves captured on previous days. The processing crew includes the gunner and 1 assistant.

All wolves are captured using 400-500mg of Telazol (tiletamine and zolazepam) delivered in projectile syringes fired from a syringe rifle. Darts with 1.9 cm (3/4 in) barbed needles fired with "Low" propellant charges ("brown wads") are used for all captures.

Once wolves are immobilized, body temperatures are determined initially with a rectal thermometer and monitored continually if approaching 40.6° C (105° F). Wolves with body temperatures higher than 40.6° C (105° F) are cooled with water and/or with snow packed in the groin and along the animal's belly. Cooling continues until rectal temperatures are below the threshold. Wolves that are incompletely immobilized or that recover during handling are given additional doses of Telazol or Ketamine to maintain appropriate anesthesia.

Each wolf is weighed and physical measurements are taken. Wolves are examined to determine overall body condition and the presence of injuries. Their teeth are examined and measured to determine the extent of wear and breakage and to estimate their age. Breeding status is evaluated by teat and testis condition. A 25 ml blood sample is drawn from the cephalic vein for hematology, serology, and genetics analyses. Immobilized wolves are left in a safe location (e.g. away from open water or steep slopes) and allowed to recover from anesthesia undisturbed. All wolves captured are located later the same day or the day after capture to determine that they have recovered from the immobilization and rejoined packmates.



WOLF CAPTURE DATACAKN *wolfcapsheet.doc*PARK _____ WOLF # _____
RECAP? _____ LASTCAP _____ OLDFREQ _____

CAPTURE DATE ____ / ____ / ____ WEIGHT _____ SEX ____ AGE(EST) _____

LOCATION, GENERAL _____

COORDINATES (WGS84): LAT ____ ° ____ ' N, LONG ____ ° ____ ' W

PACK _____ COLOR/MARKINGS _____

RADIO SERIAL # _____ MAGNET OFF? _____ VERIFIED? _____ FREQ _____

VHF GPS ARGOS ID # _____ SET OF HOLES USED _____ (from transmitter)

CAPTURE METHOD _____ SHOOTER / PILOT _____ / _____

DRUG _____ DOSE _____ DART LOCATION _____ DART TIME _____

GENERAL BODY CONDITION _____

TEAT / TESTIS LENGTH _____ cm WIDTH _____ cm TEAT COLOR _____

VULVA APPEARANCE / DISCHARGE _____

CANINE LENGTH UL _____ LL _____ UR _____ LR _____ CHECK MOUTH FOR STICK _____

CANINE WEAR, UL _____ UR _____ ERUPTION: UL _____ UR _____
None, Rounded, Blunt, or Flat tips Forward,
Down, or BackUPPER CARNASSIAL WEAR: NONE CAPPED CUSPS PITTED CUSPS PITTED CUSPS & VALLEYS
HEAVY

TOOTH WEAR: UPPER INCISORS _____ LOWER INCISORS _____

GENERAL TOOTH CONDITION, STAINING _____

PUP CHARACTERS: RADIUS-ULNA BUMP _____ HAIR COAT _____

SPECIMENS DRUG BOOST TEMP PULSE O₂ RESP TIMEblood:Longmires _____

serum (red) _____

EDTA (purple) _____

tissue: hair _____

cheek swab _____

other _____

REMARKS _____

PHOTOS _____

ASSOCIATES: (#, COLORS) _____ (COLLARED WOLVES) _____

OBSERVERS _____

revised 02/07



AGING WOLVES BY TOOTH WEAR

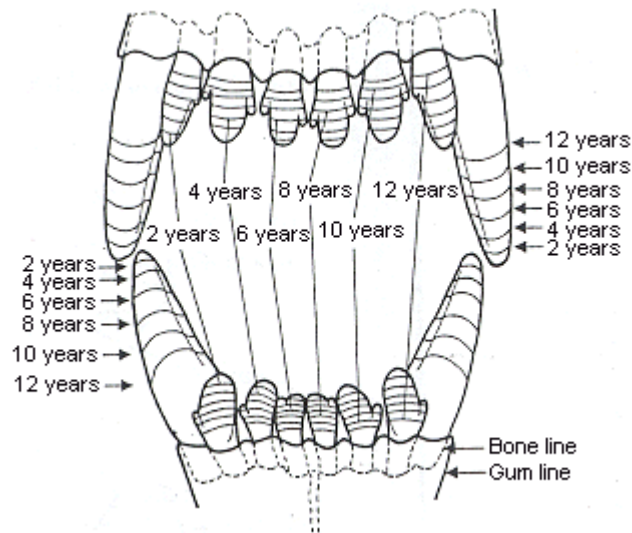


Fig. 1. Progressive wear on wolf incisors and canines in 2-year increments from ≤ 1 to ≥ 12 years of age. Wear on incisors typically progresses beyond the lobes on the first 2 upper and lower incisors at 8 years of age, leaving approximately 5 mm of enamel. At 10 years of age, 2-4 mm of enamel remain on the first and second incisors. Length of canines is reduced 30-50% with 10-16 mm of enamel remaining. Beyond 12 years of age, incisors may be worn to the roots, with a few peg-like stumps projecting above the gum line, or the gums may cover the roots. Length of canines is reduced $\geq 50\%$ with ≤ 10 mm of enamel remaining.

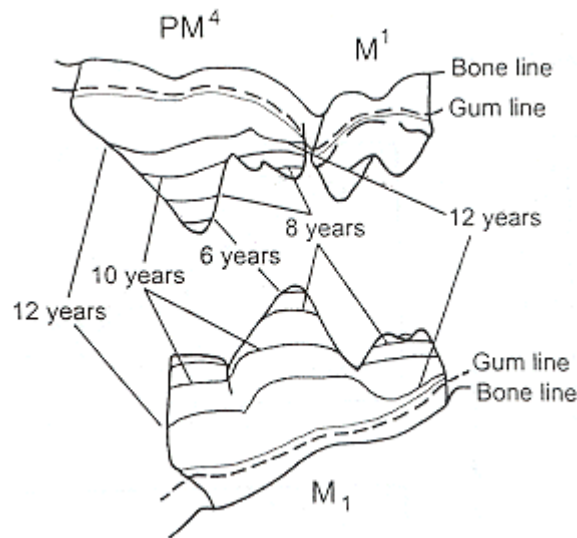


Fig. 2. Progressive wear on wolf carnassials (upper premolar 4 and lower molar 1) in 2-year increments from ≤ 6 to ≥ 12 years of age. Wear is visible on tips of major prominences at 5 years of age and profiles flatten slightly by 6 years. Deep wear on the posterior cusp of the lower carnassial after 10 years of age results from occlusion with the first upper molar, not the upper carnassial.

Source: Gipson, P.S., W.B. Ballard, R.M. Nowak, and L.D. Mech. 2000. Accuracy and precision of estimating age of gray wolves by tooth wear. *Journal of Wildlife Management* 64: 752-758.



Appendix K. Field Guidelines

These field guidelines are intended to provide descriptions of management responses for the most common types of problems experienced at Denali.

1. Repeated observations of wolf in one location:

- Contact District Ranger and Wildlife Biologist if it appears closure may be needed. Contact the Communication Center if a closure proposal is implemented. Follow the guidelines in appendix H (closure SOP) to implement a temporary or emergency closure.
- Remove closure when hazard is gone.
- Document observations (Appendix F).

2. Wolf in developed area:

- Notify the appropriate parties.
- Inform other staff or visitor center staff if in area of VC.
- Inform visitors or residents in the area.
- Inform the Communication Center.
- Monitor the wolf's activities.
- Document initial report or observation.

A. Initial contact with wolf:

- Mark the animals with a paint gun if possible and necessary. Initiate hazing to get it out of the developed area using the least intrusive methods possible. Progress to marking and aversive conditioning if warranted (see section on aversive conditioning).
- Insure wolf safety information is posted in campground
- The District Ranger will initiate extra patrols to contact visitors and provide information on appropriate behavior.
- Interpretive Division will mention the situation during walks and talks.
- The Wildlife Biologist will go through the Visitor Center and Backcountry Desk Supervisors to ask the VC give additional warning to campers receiving permits for that area.
- Continue to monitor the wolf activities and behavior patterns.



- Document all actions

B. Second contact; same wolf and initial hazing has not worked:

1) Attempt to discern what is attracting the wolf to the site, is it attracted to the campground, the backcountry campsite, or is it attracted to some other physical attribute of the site? Is it attracted to people, pets, or anthropogenic food? It is important to understand the nature of the attractant prior to initiating a management action designed to alter the animal's behavior. Document your thoughts.

2) Initial closure:

- Consider closure, especially for small campgrounds, to give the wolf a chance to move out of the area. If in the backcountry, consider closing all or a portion of the backcountry unit.
- Maintain closure for 5 days and patrol the area for the presence of the wolf.
- If the wolf is still frequenting the area, consider extending the closure.
- Implement / continue aversive conditioning of the wolf.
- Document all actions.

3. People on road less than ¼ mile of a wolf.

- Provide information about the current situation and wolves in general. Provide copies of the wolf encounters brochure.
- Offer transportation out of area.
- If the wolf is approaching people closely, attempt to mark the animal, if necessary, with a paint gun and then actively chase the wolf away, monitor the wolf's behavior. Consider removing the people from the area.
- If people are intentionally approaching the wolf, make sure they have a copy of the wolf encounters brochure, consider written warnings or citations.
- Document all actions.

4. Private vehicles stopped, observing wolf.

- Provide information about wolves and safety around wolves.



- If time permits, monitor the situation, especially in spring or fall when private vehicles are allowed to drive the road.
- Encourage people to move on after a reasonable time observing the wolf.
- Rangers should try to stay with groups of photographers and enforce Code of Ethics for photographers with permits. Emphasize to visitors human and wolf safety is of concern.
- Document all actions.

5. Dead animal (kill site)

- Notifications
- Inform other staff or visitor center staff if in area of VC.
- Inform visitors or residents in the area.
- Inform the Communication Center.
- Conduct an investigation.
- Document initial report or observation

A. No wolf or bear on carcass

- 1) If the carcass is in area where a closure won't be effective, such as within 300 meters of developed site, general area enclosed by, Riley Creek Campground, The Visitor Center, The Science and Learning Center, within 50 meters of Highway 3, or along Alaska Railroad:
 - Attempt to move carcass to an area less frequented by people or where closures or patrols can control people.
 - The Wildlife Biologist, in consultation with the District Ranger, will decide on the relocation site. (e.g. the service road North of Sanctuary Campground, or the service road East of Teklanika bridge, service road beyond Toklat Road Camp).
 - Close relocation area if necessary (Appendix H).
 - Open when the carcass has been consumed.
 - Document all actions.
- 2) Within 100 meters of backcountry trail or within 800 meters of park road and on a constricted, regular travel route:
 - Close the area at access points and around carcass (Appendix H).



- Patrol the area to see if the carcass has been consumed.
 - Open when the carcass has been consumed.
 - Document all actions.
- 3) Further than 800 meters off road and not within 100 meters of trail or common route:
- The District Ranger will request that staff issuing backcountry permits or contacting day hikers inform these parties of the location of the carcass.
 - Discontinue this process once the carcass has been consumed.
 - Document all actions.

B. Wolf or bear on carcass

- 1) In frontcountry, along road, view points, access points for travel routes, within 300 meters of developed site:
- Notification.
 - Inform other staff or Visitor Center staff if in area of VC.
 - Inform visitors or residents in the area.
 - Inform the Communications Center.
 - Close the area.
 - Patrol regularly to ensure people are not in the area.
 - Open when the carcass has been consumed and the wolf is out of the area.
 - Document all actions.
- 2) In Backcountry:
- Inform backcountry desk staff
 - Close area especially if it is frequented by backcountry users
 - Patrol the area and open when the carcass has been consumed
 - Document all actions.



6. Single wolf - human interaction, no injury and no food obtained.

- Initiate hazing, if in the frontcountry, try to get it out of the developed area using the least intrusive methods possible. Progress to marking and aversive conditioning if warranted (see section on aversive conditioning).
- If necessary, escort people away from the wolf without provoking further interactions.
- Conduct an initial investigation for the causes of the incident.
- Monitor the situation.
- Make appropriate notifications.
- Document all actions.

A. Interaction resulting from intentional or unintentional harassment:

- Provide information concerning wolf behavior to individuals involved to prevent future negative interactions.
- Consider written warnings or citations.
- No management action directed toward the wolf.
- Consider a closure to give the wolf a chance to not encounter people (one-week maximum).
- Document all actions.

B. Interaction resulting from a surprise encounters, defensive interaction, mistaken predatory response:

- Provide information concerning wolf behavior to individuals involved to prevent future negative interactions.
- No management action directed toward the wolf.
- Consider a closure (one-week maximum).
- Document all actions.

C. Wolf shows interest in, or has obtained anthropogenic food:

- Attempt to mark (radio collar) the animal for future positive identification.
- Consider closing the area or campground.



- Initiate hazing or aversive conditioning.

D. Wolf exhibiting threatening behavior:

- Attempt to mark (radio collar) the animal for future positive identification.
- Implement aversive conditioning.
- Test
- If dangerous behavior has already occurred more than once or continues, consider placement in a zoo or research facility or destruction.

7. Wolf exhibiting tolerant, fearless, conditioned or rewarded behavior. No injuries or food obtained:

- Conduct a thorough review of all interactions. Review the causes of the animal's behavior and determine if the problems in the area are related to one animal. Attempt to discern what is attracting the animal and the nature of any conditioned behavior.
- If the Wildlife Management Technicians, District Ranger and Wildlife Biologist feel an animal represents an unusual threat to visitor safety, close area.
- Initiate patrol procedure.
- Attempt to mark the animal for future positive identification.
- Implement aversive conditioning and test.
- If fearless behavior continues after several aversive conditioning trials, consider placement in a zoo or research facility or destruction.

A. If patrol procedure identifies an animal attracted to human food or conditioned:

- Attempt to mark the animal.
- Initiate aversive conditioning.
- Test to determine if aversive conditioning was successful.
- If aversive conditioning fails, consider placement in a zoo or research facility

B. If the wolf demonstrates threatening behavior toward people:

- Consider destruction



C. If patrols do not find a wolf demonstrating these behaviors, open the area after three clear patrols and/or two weeks

8. Wolf obtains anthropogenic food:

A. All Incidents:

- Conduct an initial investigation to determine the type of incident.
- Make appropriate notifications
- Consider written warnings or citations
- Provide information concerning wolves to individuals involved
- Consider how food and garbage handling practices may have contributed to the incident when selecting management options
- Document all actions

B. Backcountry:

- Close the area, remove any anthropogenic attractants.
- Clear the area and locate the wolf
- Attempt to mark (radio collar) the animal
- Initiate hazing or aversive conditioning
- If the patrol is unsuccessful in finding the animal, open the area after five days

C. Frontcountry:

- Remove anthropogenic attractants. Correct any food or garbage handling problems
- Identify the wolf
- Attempt to mark the animal.
- If wolf returns, initiate hazing or aversive conditioning.
- Test aversive conditioning results.
- Consider placement in a zoo or research facility or destruction if aversive conditioning fails after several attempts.
- If the patrol is unsuccessful in finding the wolf, open the area after five days



9. Hazing and Aversive Conditioning of Wolves

Hazing and aversive conditioning are the primary management actions directed towards wolves that display fearless, conditioned, rewarded, or threatening behavior. These techniques range from yelling and arm waving to using paint guns, rubber slugs, beanbag rounds, cracker shells, or capsicum spray. Aversive conditioning is designed to eliminate a detrimental, unsafe, or unnatural behavior. In general, aversive conditioning is conducted in a manner where the effectiveness can be tested. Management actions in the future should be based on past experiences so clear and complete documentation is essential.

Park staff should be informed of ongoing Wildlife Management activities and interpreters should be provided information to share with visitors regarding the history and reasoning behind current wildlife management activities. Interpreters will be encouraged to share this information with visitors at interpretive programs.

Potential Situations Warranting Hazing or Aversive Conditioning

The categorization of wolf behaviors and management responses to these behaviors provides an immediate list of options (Appendix B). Wildlife Management Technicians will respond to situations using this documented protocol as a starting point. However, wolf-human interactions are unpredictable and vary in clause and scope, therefore decisions must be made by logically assessing the situation. The following is a list of situations in which hazing or aversive conditioning of wolves may occur:

- Wolf frequenting a frontcountry campground
- Wolf approaching humans
- Wolf approaching backcountry camp
- Wolf exhibiting fearless behavior
- Wolf damaging or removing property
- Wolf gets food
- Wolf causes human injury

(1) General Procedure

When preventative methods of deterring wolf-human interactions fail, the level of management action taken will be determined by the nature of the conflict.

- a) Assess the situation. Does it warrant action or will it resolve itself acceptably given time and monitoring? How many wolves are there? What color are they? What is their species and age class? Define your objective. Have as many facts as possible before initiating aversive conditioning.
- b) Remove spectators from the area before initiating any actions. Provide interpretation if possible. Always provide the wolf an escape route.



- c) Apply techniques in a progressive manner; use the minimum tool that will safely accomplish your objective. In general, yelling, loud noises, and rock throwing, should precede uses of cracker rounds, or capsicum-based sprays, If these techniques fail more aggressive methods may be used.

The success of cracker rounds, rubber or plastic slugs, beanbag rounds, capsicum-based sprays and shock collar systems may vary with individual wolves. The Wildlife Biologist must clear all operations involving these techniques. Only properly trained individuals can use these techniques.

Aversive Tool	Effective Range
Pepper Spray	1 to 5 yards
12 ga Bean Bag	5 to 20 yards
12 ga Flocchi Rubber Baton	15 to 30 yards
12 ga BD-100 Rubber Slug	20 to 30 yards
12 ga Cracker Shell	Explodes at about 80 yards
Electric Tent	Animal must contact the tent

- d) Mark the wolf (i.e. radio collar, paint gun) for positive identification for future management actions.
- e) Interpret reasons for actions to any visitors who view the events.
- f) Aversive conditioning must be conducted several times, often over several days. If these attempts fail, management actions may be escalated. In frontcountry situations, managers will consider accelerating the response.



Appendix L. Summary of Individual Responsibilities for Implementing the Wolf-Human Conflict Management Plan

Note: The responsibilities listed below are the same as the ones listed in the Bear Human Conflict Management Plan. The responsibilities dealing with food and garbage storage and handling are not listed below.

Superintendent

1. Responsible for approving the Wolf-Human Conflict Management Plan and revisions.
2. Approves/disapproves the destruction of problem wolves after consultation with the Assistant Superintendent of Resources, Science, and Learning, Wildlife Biologist, Chief Ranger, and District Ranger.
3. Approves or disapproves recommendations for temporary and emergency closures.

Concession Specialist

1. Contract Bus Driver Responsibilities Include:
 - a) Include information regarding the Alpenglow wolf article, current closures, and regulations pertaining to the feeding of animals, in initial message to passengers.
 - b) Use Alpenglow wolf article as reference when answering questions.
 - c) Direct people who have been involved in an interaction with wolves to DENA staff.
 - d) Report any wolf-human interactions they may witness on the park road to DENA staff.
 - e) Remain current on the locations of temporary and emergency closures. Informs the day hikers on the location of temporary and emergency closures.
2. Visitor Access Center Campground and Bus Desk Staff Responsibilities Include:
 - a) Direct people who have been involved in an interaction with a wolf to DENA staff.

Ranger Activities Division

1. Chief Ranger

- a) Participate in cooperative decisions with Assistant Superintendent of Resources, Science, and Learning, Wildlife Biologist, District Ranger and investigating field personnel on the destruction of a wolf.
2. District and Sub-district Rangers
- a) Supervise patrol rangers ensuring that they accomplish their specific responsibilities as outlined in the Wolf-Human Conflict Management Plan.
 - b) Initiates recommendations for temporary wolf-human conflict related closures and notifies Dispatch when closures are established or lifted.
 - c) In conjunction with field staff, make recommendations and participate in decisions for translocation or destruction of wolf.
 - d) Directs the enforcement of wolf management regulations.
 - e) Responsible for posting closure signs and other special wolf related notices.
3. Patrol Rangers
- a) At every opportunity, advises visitors of proper food storage procedures and appropriate behavior when near wolves. Enforces pertinent regulations as necessary.
 - b) Completes BIMS forms, immediately forwarding them to the Wildlife Management Technicians.
 - c) Posts and enforces temporary closures, at supervisors direction when possible. Patrol Rangers may post closures on their own if the situation warrants. Follows closing procedure in appendix H.
 - d) Immediately informs District Ranger and Dispatch of all wolf incidents and wolves seen in developed areas.
4. Backcountry Sub-district Ranger
- a) Maintain the data base on BRFC use on the backcountry computer.
 - b) Insure that the backcountry desk staff are providing wolf safety information to all backcountry users.

5. Backcountry Desk Staff
 - a) Distributes the Alpenglow to all hikers and strongly recommends they read the wolf safety article. Provides the foreign language version of the wolf safety brochure to French, German, Spanish, and Japanese speaking visitors
 - d) Asks all returning hikers about bear and wolf interactions and completes BIMS and WEF forms when appropriate.
6. Mountaineering Rangers
 - a) Provides wolf safety information to all backcountry travelers entering wolf habitat. Provides the foreign language version of the wolf safety brochure to French, German, Spanish, and Japanese speaking visitors. Provides, and encourages the use of, BRFC to all backcountry travelers on the south side of the Alaska Range.
7. Communications Center
 - a) Keep opening/closing log (Appendix H.
 - b) Immediately inform Wildlife Technicians, Wildlife Biologist, and District Ranger when an incident is reported.
 - b) Immediately inform Wildlife Technicians, Wildlife Biologist, District Ranger, and VAC and Eielson Visitor Centers, and others on the notification list (Appendix H.) of closures and lifting of closures of areas where incidents have occurred and of developed areas where wolves have been seen. Also includes this information in morning reports.
8. Kennels Manager

Will provide detailed training on how to minimize wildlife sled dog interactions to anyone involved in the summertime dog walker program, and the winter dog sled patrol program. Consults with Wildlife Biologist to develop and update these training materials.
9. Campground Hosts
 - a) Record wolf-human interaction on Wolf Encounter Form.

- b) Inform Wildlife Management Technicians and Patrol Rangers of all reports of wolf activity.
- 9. Alaska Public Lands Information Centers (APLIC).
 - a) Point out campground regulation written on back of camping permit.

Center for Resources, Science, and Learning

Resources Division

- 1. Assistant Superintendent for Resources, Science, and Learning.
 - a) Insure that Division Chiefs review their division's responsibilities in implementing the wolf-human conflict management plan every spring.
- 2. Supervisory Wildlife Biologist
 - a) Monitor impacts of management programs on wolf populations.
 - b) Devise, test and review new methods of managing wolf-human conflicts before they are implemented.
 - c) Provide recommendations for wolf research, write proposals, assist with data analysis, manuscript production, and publication development
 - c) Make presentations at training and professional sessions.
 - d) Arrange training sessions for proper techniques in chemical immobilization and wildlife handling for the Wildlife Technicians, as necessary.
 - f) Develop and revise the wolf-human conflict management plan.
 - g) Coordinate and annually evaluate the wolf-human conflict management program.
- 2. Wildlife Biologist
 - a) Oversee WEF and other wolf management/research records.
 - b) Participant in wolf management actions if necessary

- c) Oversees the preparation of summaries and written reports of park's wolf-human conflict management activities for the park, regional office and other agencies and organizations as necessary.
- d) Supervise Wildlife Management Technicians.
- e) Ensure that wolf ecology and safety training is provided to DENA, concession and local business employees.
- f) Make presentations at training and professional sessions.

3. Wildlife Management Technicians

- a) Maintain readiness and quickly respond, investigate and document incidents. Implements management actions according to this plan or supervisor's direction. Must be prepared to stay out in the Park for several days/nights at a time.
- b) Maintain capture, aversive conditioning, telemetry, vehicle and other wolf management related equipment in a ready condition at all times.
- c) Coordinate training sessions on prevention of wolf-human conflicts for DENA employees, concession employees and bus drivers at beginning of each season. Documents all training sessions for inclusion in annual report.
- d) Coordinate with backcountry desk staff to maintain a supply of BRFCs and data forms. Checks with desk staff at least twice a week for Wolf Encounter Forms and damaged BRFCs.
- e) Post closure or warning signs as stated in closure procedures in appendix H.
- f) Compile and analyze wolf-human conflict data and draft annual reports.
- g) Monitor kill sites, keep track of predatory events.
- h) Order and maintain supply of Denali wolf safety information brochures, and closure and warning signs.
- i) Compiles biweekly bear activity updates and distributes them to park staff and park partners (see notification list in Appendix H.) Include recent wolf and bear incidents, unusual encounters, other noteworthy wildlife activity.

3. Drug Practitioner (Usually one of the Wildlife Biologists)
 - a) Purchases, maintains inventories and distributes drugs to field areas.
 - b) Coordinates and teaches annual drug related wolf management and handling training sessions.
 - c) Responsible for immobilization and capture equipment.

Interpretive Division

1. Supervisors
 - a) Inform the Park's visitors of the wolf situation at evening programs, visitor centers, on guided walks and during informal public contacts.
 - b) Consult with Wildlife Biologist and the Wildlife Management Technicians in preparation of books, pamphlets and other materials on wolves and ways to minimize wolf-human conflicts.
 - c) Maintain supplies of Alpenglow at the Visitor Center, Eielson Visitor Center, The Savage Check Station, The Science and Learning Center.
 - d) Responsible for initial posting and maintenance of wolf behavior information on bulletin boards.
2. Field Staff
 - a) In all programs and guided walks interpreters will comment on the potential for wolf-human conflict and recommend specific behavior to minimize the potential for conflict.
 - b) In introductory remarks to guided walks, discuss the group's action if they encounter a wolf.
 - c) Spend a few minutes talking about wolves if a program is canceled due to wolf activity in an area.
 - d) Eielson Visitor Center staff will record all wolf observations within a 1/4 mile area of Visitor Center.
 - e) Record all wolf-human interactions they hear about from visitors or other staff on Wolf Encounter Form.

Other Responsibilities

- a) All supervisors (concession and Park) will ensure their employees are aware of the Park's bear and wolf (because they work synergistically) management objectives and the methods being used to achieve those objectives.
- b) All employees are responsible for correcting deficiencies in garbage handling, and food storage as they become aware of them or to call them to the immediate attention of someone who can correct them. If informal communication does not result in prompt correction, the recommended action or statement of problem will be given to a higher level supervisor and the Wildlife Biologist.
- c) All park divisions and functions will coordinate their respective wolf management needs through the Wildlife Biologist.

