

A CASE HISTORY OF WOLF–HUMAN ENCOUNTERS IN ALASKA AND CANADA

by

Mark E McNay



Photo courtesy of BC Parks

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Mary V Hicks
Publications Specialist
ADF&G, Wildlife Conservation
PO Box 25526
Juneau, AK 99802-5526
(907) 465-4176

Mo_Hicks@fishgame.state.ak.us

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Mark E McNay

STATE OF ALASKA

Tony Knowles, Governor

DEPARTMENT OF FISH AND GAME

Frank Rue, Commissioner

DIVISION OF WILDLIFE CONSERVATION

Wayne L Regelin, Director

Steven R Peterson, Senior Staff Biologist

Alaska Department of Fish and Game

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EXECUTIVE SUMMARY

Currently there are an estimated 59,000–70,000 wolves (*Canis lupus*) in Alaska and Canada. Past reviews of wolf–human interactions concluded that wild, healthy wolves in North America present little threat to human safety. However, since 1970 some cases have appeared in the published literature documenting wolf aggression toward people. A wolf attack on a 6-year-old boy near Icy Bay, Alaska in April 2000 generated debate in Alaska that challenged previous assumptions regarding the potential danger of wolves to people. At that time there was no recently compiled record of wolf–human encounters for either Alaska or Canada.

To provide a current perspective on wolf–human interactions, I compiled a case history that describes 80 wolf–human encounters in which wolves showed little fear of people. I obtained cases from biologists and law enforcement officers in Alaska and Canada, from public health records, from the published literature, and from interviews with private citizens who witnessed the events. I classified the 80 cases into 7 behavioral categories: 1) Agonism, 2) Predation, 3) Prey Testing or Agonistic Charges, 4) Self-defense, 5) Rabies, 6) Investigative Searches, and 7) Investigative Approaches.

Patterns of wolf behavior described in this case history provide a reference for management of wolves where frequent wolf–human encounters occur. Thirty-nine cases contain elements of aggression among healthy wolves, 12 cases involve known or suspected rabid wolves, and 29 cases document fearless behavior among nonaggressive wolves. In 6 cases in which healthy wolves acted aggressively, the people were accompanied by dogs. Aggressive, nonrabid wolves bit people in 16 cases; none of those bites was life-threatening, but in 6 cases the bites were severe.

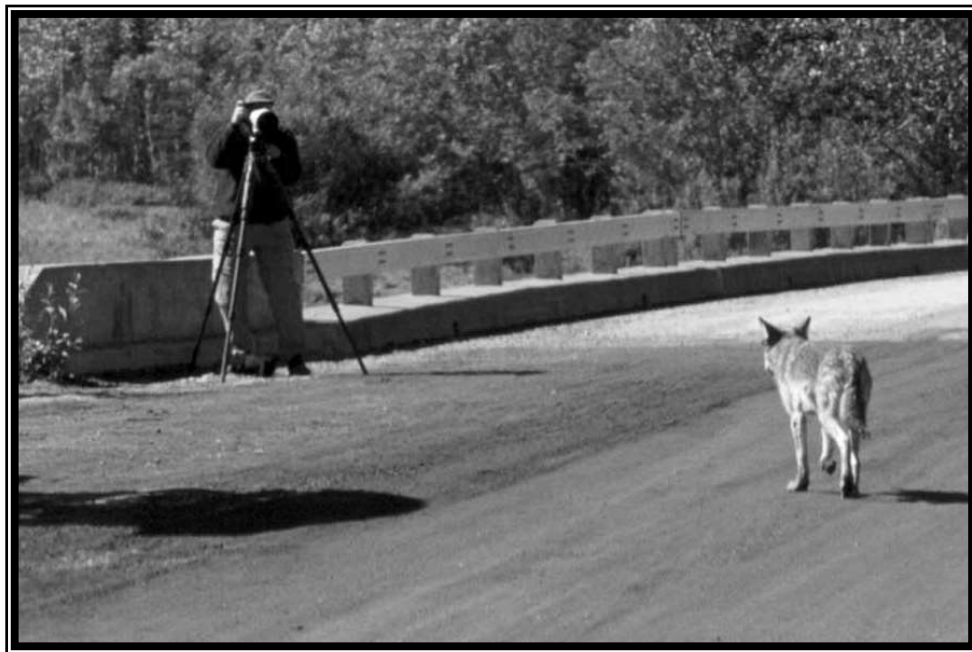


Photo by Jason Ransom



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INTRODUCTION

Previous reviews of wolf–human interactions found that wolf aggression toward humans was rare in North America (Young 1944; Rutter and Pimlott 1968; Mech 1970, 1990). Those reviews discounted most descriptions of wolf aggression as either exaggerations or as misinterpretations of benign encounters. When wolf attacks were substantiated, in both Europe and North America, most were attributed to either rabid wolves or to wolf–dog hybrids (Rutter and Pimlott 1968; Mech 1970). Consequently, it is now widely accepted among biologists that healthy, wild wolves present little threat to people.

Since 1970, wolves have increased and expanded their range in both Canada and the United States, and formerly exploited wolf populations are now protected. Currently there are an estimated 52,000–60,000 wolves in Canada (Hayes and Gunson 1995), 7000–10,000 in Alaska (Alaska Department of Fish and Game, unpublished data), and approximately 3200 in the United States outside of Alaska (US Department of Interior 2000). Despite that large and widely distributed wolf population, no human deaths have been attributed to wild, healthy wolves since at least 1900, and biting incidents or bluff charges are rare enough to warrant publication in scientific journals (Munthe and Hutchison 1978; Jenness 1985; Scott et al. 1985). However, in April 2000 a wolf attacked and repeatedly bit a 6-year-old boy near Icy Bay, Alaska. That incident stimulated a debate in the Alaskan legislature that questioned the generally accepted view of wolf–human interactions. Wolf control was proposed for some rural areas to enhance public safety, and biologists were unable to add scientific perspective to the debate because there



was no recent compilation of records that documented wolf aggression toward people in North America.

Following the incident at Icy Bay, I began to solicit and compile cases of wolf-human encounters in which wolf behavioral responses to human presence deviated from what was considered "normal" avoidance. I did not limit my investigation to aggressive encounters but included cases where wolves displayed nonaggressive, yet fearless, behavior. The case history presented here is the culmination of that investigation. The purpose of this technical bulletin is to provide a current perspective for wolf-human interactions in a variety of contexts in Alaska and Canada.

METHODS

I contacted biologists and law enforcement officers, via telephone and e-mail, in Alaska and in all of the provinces and territories of Canada where wolves currently exist. I began by contacting the carnivore or furbearer biologist in each jurisdiction, and then based on their recommendations, I contacted additional officials or private citizens until I spoke with a witness or an official who was involved in or had investigated a specific incident. I obtained investigative reports where possible, conducted follow-up interviews with other witnesses or officials, and reviewed newspaper or newsletter articles supplied by those individuals. I interviewed trappers, hunters, photographers, hikers, and pilots that were involved in wolf-human encounters when official investigative reports were not available. I found several cases in the records of the Alaska State Virology Laboratory because wolves that exhibit fearless behavior are often killed and submitted for rabies testing. In the virology records, a brief narrative described the circumstances for each tested wolf. I also included cases from published accounts that appeared in books and scientific journals.

I systematically queried state, provincial, and territorial wildlife agencies in Alaska and Canada, but the case history is not exhaustive, nor does it represent a random sample of wolf-human encounters. I censored 33 cases because I could not establish dates, locations, identities of people, or other specific circumstances.

Young (1944) wrote the most detailed review to date of wolf-human encounters in North America. His review detailed 30 accounts of wolf aggression toward people before 1900 and included 6 cases in which wolves possibly killed humans. However, Young (1944:128) prefaced his review with the statement: "Whether these stories are products of the fertile imaginations, or are truth, is difficult to determine." Therefore, I did not include the encounters described by Young (1944), nor did I describe any cases that involved captive wolves or cases of predation by wild wolves on pets or livestock, unless the wolf simultaneously exhibited fearless behavior toward people.

I organized wolf-human encounters among 5 behavioral categories that describe aggressive behaviors and 2 categories that are nonaggressive. Aggressive encounters include cases in which wolves bit or attempted to bite people; people defended themselves at close range from rapidly approaching wolves; or wolves acted aggressively or displayed threats in self-defense. Nonaggressive encounters include cases in which wolves approached or passed near people and then either ignored the people or were easily and quickly frightened away. I classified each case

based on the behavior that presented the greatest threat to people. For example, cases in which wolves exhibited scavenging behavior before biting or threatening a person were categorized based on the bite or threat rather than on the scavenging behavior.

CATEGORIES OF AGGRESSIVE BEHAVIORS

Agonism is a behavioral pattern exhibiting features of both aggression and avoidance, arising from a conflict between aggression and fear (Rudin 1997). Agonistic behavior includes most aggressive behaviors and nonaggressive ritualized behaviors related to wolf social interactions including territorial defense, rank-order interactions, and sexually motivated aggression. Agonistic aggression is often preceded by some warning or threat display (Fox 1971:134).

Predation involves a series of connected behaviors that lead to the consummatory act of eating. Therefore, predation can be identified by its elements, namely a) orientation toward the prey, b) following (i.e., stalking or rushing approach), c) catching, and in the case of small prey, d) carrying and sometimes shaking. Unlike agonism, predation is generally not preceded by a threat display or vocalization (Fox 1971:134). Most or all of the elements of predation were observed in cases I classified as predation.

Prey testing or agonistic charges are described in a number of cases in which aggressive behavior could have been either predatory or agonistic. All such cases involved aggressive behavior that required people to defend themselves at close range.

Self-defense includes aggression by wolves in defense of their young, in defense of a mate, or in self-defense. Defensive behavior is agonistic, but I separated self-defense from other agonistic behaviors because self-defense was provoked by human intrusion or aggression.

Rabies includes cases in which wolves were either diagnosed with rabies or an official involved in the investigation made a presumption of rabies based on circumstantial evidence. For cases based on circumstantial evidence alone, I noted possible alternative explanations for aggressive behavior where they existed.

CATEGORIES OF NONAGGRESSIVE BEHAVIORS

Investigative search behaviors were exhibited by wolves that either curiously walked toward people or searched and scavenged in human-use areas such as campgrounds or remote campsites. Investigative search also included a distinct subcategory of escort behaviors in which wolves followed behind or paced alongside people at close range.

Investigative approaches were similar to prey testing/agonistic charges because in both behaviors wolves ran toward people. However, in investigative approaches, the rapid approach ended when wolves stopped at a safe distance from people and then retreated without making threat displays. Those cases were considered nonaggressive and possibly resulted when wolves were unable to identify people, or misidentified people as potential prey, from long distances.

RESULTS AND DISCUSSION

I interviewed or corresponded with 62 individuals in Alaska and Canada regarding wolf-human encounters (Appendix) and from their responses I compiled 80 cases. Forty-one cases were from provinces and territories of Canada, 36 cases occurred in Alaska, and 3 cases occurred in northern Minnesota (Fig 1). Thirty-nine cases contained elements of aggression by healthy wolves, 29 were nonaggressive, and 12 involved known or suspected rabid wolves. In 16 cases healthy wolves bit people or bit into their clothing, but most bites were minor. Among the 6 severe bites inflicted by wolves (Cases 1, 4, 14, 15, 16, and 17), none was life-threatening, but 4 of those cases involved children, and the injuries could have been more serious if rescuers had not intervened. Six cases involved aggression by wolves toward people that were accompanied by dogs; in 2 of those cases the wolves bit people.

In the following case summaries I present a description of the encounter and, where available, the interpretations of witnesses or investigators. However, interpretations of wolf-human encounters can be highly subjective, especially if the encounter involves an animal the witness perceives to be either inherently dangerous or, conversely, inherently benign. Therefore, where appropriate, I attempt to discuss alternative interpretations that could explain the behavioral actions of the wolves involved.

AGGRESSIVE ENCOUNTERS

Agonistic Behaviors

Where wolves become habituated to people, often as the result of food conditioning, wolf-human encounters may occur at close range and be prolonged because habituated wolves do not exhibit an avoidance response. Sometimes those encounters result in aggressive wolf behaviors that reflect an agonistic response to a human action the wolf perceives as threatening, annoying, or unexpected. Cases 1–14 illustrate agonistic behaviors toward people. Most involve habituated or food-conditioned wolves, but one case (Case 7) illustrates a low-level threat behavior by a nonhabituated wolf. In Cases 2, 3, 13, and 14, people were accompanied by dogs. In those cases the wolves' response was agonistic, but the aggressive behavior was likely influenced by the presence of the dogs.

CASE 1 — Vargas Island, British Columbia, 2000.

In mid-June wildlife photographer Jacqueline Windh arrived on Vargas Island by kayak. She was working with another photographer who had arrived shortly before and had witnessed 2 people feed a female wolf nearby. After Windh arrived, the female wolf approached and as the photographer crouched to take photographs, the wolf walked directly toward her sniffing at the camera lens. Windh held out her closed hand; the wolf sniffed and gently bit with its teeth, apparently testing to see if the woman was holding food. When the wolf found no food, it licked Windh's hand. Later a male wolf joined the female; he was more assertive and rapidly approached, nipping at a tear in the knee of Windh's pants and at her bare toes that were sticking out of her sandals, but his biting motions were inhibited.

The photographers camped near the beach for 2 days and the wolves remained in the area; the female wolf slept near the photographers' tents. The wolves attempted to steal articles of clothing and camping gear but did not obtain food. Windh reported the female wolf pulled water jugs from beneath a log, playfully pushed them around, and would also crouch in front of her and

then run in a circle and crouch again, as if soliciting a play or chase response. Late on the second day, the pair of wolves became more persistent in their approach. Finally, the male approached directly toward the photographers with his head lowered as the female wolf circled behind. The photographers interpreted that behavior as more threatening than earlier approaches and they backed up the beach side by side. After a few minutes, they were able to drive the wolves away by throwing rocks. The next morning the 2 photographers left the island. Windh later reported that other people in the area told her that the wolves had been hand-fed the year before as pups, and that they had been thoroughly habituated to people during several encounters that involved both feeding and play.

A few days after Jacqueline Windh left Vargas Island, another group of 18 people camped at a nearby campsite. Most slept in tents, but 2 men laid their sleeping bags in the open near a campfire ring. One of the campers near the fire awakened at 1:30 AM to find a wolf sitting on the end of his sleeping bag. The startled camper yelled, but the wolf did not move. Another camper in a nearby tent heard the shouts and discharged a noisemaker that scared the wolf away. The man who had encountered the wolf moved into a tent, but the second camper remained outside and was awakened by a wolf pulling on his sleeping bag about 2:00 AM. The wolf dragged the man a few meters but released its grip and took a step backward when the man awakened and shouted. The wolf then moved forward, attacking the man's upper body that was still encased in the sleeping bag. Again the man shouted, attempted to fend the wolf off with his arms, and began rolling back toward the fire pit, but the wolf attacked the back of the man's head inflicting serious lacerations and lifting part of the victim's scalp. Eventually, fellow campers emerged from their tents and drove the wolf away. The victim estimated the attack lasted for about 5 minutes. He was transported to a hospital in Victoria B.C. where he was treated for injuries to his scalp, back and hands. It required more than 50 stitches to close the wounds in his scalp.

Early the next morning conservation officers killed 2 wolves near the campsite, a young male weighing 37 kg and a young female weighing 29 kg. Both wolves were in good condition and tested negative for rabies. The gastrointestinal tracts of both wolves contained remains of ungulate prey but no evidence of human food or garbage. Reproductive organs in both wolves appeared to be immature, suggesting the animals were approximately 14 months of age at the time of the attack.

The wolves that were killed near the attack site were later identified as the same wolves that had interacted with people in various locations on Vargas Island. Both wolves were obviously food conditioned and thoroughly habituated, but they were also highly socialized with people, as evidenced by their attempts to solicit a play response from Jacqueline Windh. However, despite that high level of socialization and habituation, the wolf acted aggressively when the man in the sleeping bag shouted, waved his arms and began rolling on the ground. The wolf's aggression apparently increased during the incident, possibly as a social response to what it perceived as agonistic behavior by the man (i.e., fearful aggression), or as an exaggerated approach response when it was denied the food handout that had been frequently offered by other campers in a similar context. After the 2 wolves were killed, other wolves continued to visit campsites on nearby Flores Island where they stole shoes, camping gear, and clothing from tents. Those incidents indicated that other members of the wolf pack were similarly conditioned.

Source: M Stern. 2000. Vargas Island wolf attack, unpublished investigative report, British Columbia Ministry of Water, Land and Air Protection, Nanaimo, BC; Jur Bekker, British Columbia Provincial Parks, personal communication; and Dr Jacqueline Windh, wildlife photographer, Tofino, British Columbia, personal communication.



These wolves became highly habituated and food conditioned on Vargas Island, British Columbia after they were repeatedly fed by people. The male (left) subsequently attacked and severely bit a man who was in a sleeping bag at a popular campsite (Case 1). Photo by Jacqueline Windh.

CASE 2 — Haines Junction, Yukon Territory, 2000.

In December a woman was walking her leashed dog near her house about 10 km from Haines Junction, Yukon Territory. The house was at the base of an open hillside near the Alaska Highway. As the woman walked along her driveway she saw a black wolf sitting on the hill watching her from a distance of about 80 m. The woman became concerned when the wolf trotted off the hill directly toward her. She turned and began walking back toward the house, but the wolf came onto the driveway 10 m in front of her, blocking her path. The woman stopped, waved her arms, and began shouting; the wolf continued to look toward her but did not react. The woman then turned and walked approximately 120 m toward the highway with the wolf following a short distance behind. About 30 m from the highway the woman came to a large, car-sized boulder. She moved behind the boulder, but the wolf approached with its head lowered and stretched forward, finally stopping only a few meters away. The wolf steadily focused its eyes on the woman and her dog, but it did not vocalize or snarl. For the next few minutes the woman shouted at the wolf and called out for her husband who was at the house. Finally, she saw a car approaching on the highway; she rushed toward the road and stopped the approaching vehicle. The wolf remained by the boulder until the woman and dog were inside the car, and then it moved away.

The woman later reported she was frightened by the wolf's approach and perceived the wolf's actions as aggressive rather than curious. However, she believed the wolf was probably focused on the dog. The dog had been spayed a few days earlier and that may or may not have contributed to the wolf's actions. Upon inspection of the area after the incident, the local conservation officer discovered a series of wolf trails in the snow behind the woman's house, indicating the wolf had spent considerable time in the area, possibly attracted by the presence of the dog. Throughout that winter other local residents periodically reported seeing a wolf of similar description, but the wolf did not act as if it was food conditioned, nor did it approach other people.

Source: Bob Hayes (retired), Yukon Fish and Wildlife Branch, Haines Junction, Yukon Territory, personal communication.

CASE 3 — Pacific Rim National Park, British Columbia, 1999.

The following 2 incidents illustrate wolf behavior that may become aggressive when people are closely accompanied by dogs. Similar behaviors are described in Cases 2 and 13.

In January 1999, a man was jogging with his 2 dogs near Ucluelet, B.C. when 2 wolves attacked the smaller of the dogs. The man grabbed the dog away from one of the wolves and the wolf lunged toward the man but did not make contact. The wolves then followed the man as he returned to his vehicle.

A similar incident occurred in March when a woman walking her dog encountered a wolf on a trail. The woman immediately picked up her dog and retreated to a nearby parking lot as 3 wolves followed her within 10 m.

Source: Bob Hansen, Pacific Rim National Park Reserve, British Columbia, unpublished Warden Service Occurrence Reports and personal communication.

CASE 4 — Algonquin Provincial Park, Ontario, 1996.

On 18 August a family of 5 including children ages 3, 7, and 12 were sleeping outside without a tent on Tom Thomson Lake. About 2:00 AM a wolf bit into the face of the sleeping 12-year-old and dragged him about 2 m before being driven away by the boy's father. The boy had a broken nose and 6 serious lacerations in his lower face, one of which required reconstructive surgery.

Later that day the same wolf approached a woman who was standing in shallow water on the edge of the lake. The wolf jumped toward the woman 4 times. The woman reported she thought the wolf was more playful than aggressive, and it retreated each time she told it to "get." When 2 other people arrived, the wolf moved away a few meters but did not leave the area.

Three days after the boy was bitten, the wolf approached 2 women at their campsite late in the evening. The women quickly left in their canoe and when they returned several hours later, they discovered the wolf had shredded a canvas pack and had also chewed and shredded contents of their tent. The apparently healthy male wolf was eventually shot on 23 August at the same campsite where the boy had been dragged in his sleeping bag. The wolf's stomach contained approximately 1 kg of meat, beans, carrots, string, and labels indicating that it had scavenged human garbage.

What seemed to be the same wolf had been seen repeatedly in the general area of the lake during the previous 12 days. Other campers reported the wolf seized articles of clothing or camping gear but did not seem aggressive toward people. In one encounter, the wolf pulled a pack containing clothes that was used as a pillow from under the head of a man sleeping outside his tent. The man awoke, yelled, and the wolf dropped the pack but returned and tried to dart in and take it when the man bent to pick it up. The campers had left a length of salami lying on their canoe, but the wolf seemed uninterested in food. Later, the campers found 2 tennis shoes in the brush that the wolf had stolen and chewed.

Although serious injury resulted, park officials speculated that the attack on the sleeping boy was probably not an act of predation. Instead, they speculated that the wolf's obsession with chewing and tearing human clothing and camping gear led to the wolf's pulling on an occupied sleeping bag. The pattern of rips in the bag suggested the wolf initially attempted to pull the bag by the fabric, and that it ripped with the weight of the boy. The boy's injuries were possibly inflicted when the wolf seized the boy's head in an attempt to pull the weight of the boy and the bag together. However, the existence of multiple severe lacerations indicates the boy was repeatedly bitten and suggests more was involved than a simple pull and bite. Possibly, as the

boy was dragged and awakened by the pain of the initial bite, his movements elicited an agonistic response in the wolf, or the wolf repeatedly regripped with its jaws to pull the boy's weight. Regardless, the wolf's actions were clearly aggressive, although its initial attraction to the campground may not have involved aggressive intent. In many aspects this case is strikingly similar to Case 1.

The obsession with human clothing and gear is a common theme among highly habituated wolves. Even though this wolf obviously obtained human food, it apparently never sought food in the presence of people and ignored food when easily available in the open. However, the wolf was clearly habituated to people and readily approached occupied campsites.

Source: Algonquin Provincial Park 1997.

CASE 5 — Ellsmere Island, Nunavut, 1995.

In mid-June 1995 Wildlife Officer Tabitha Mullin was standing near the front of her living quarters at the Park Warden's Tanquary base on Ellsmere Island, Nunavut. She watched and photographed a pack of 11 wolves as they approached the camp. Upon seeing her, the wolves approached to within 10 m then stopped. A single animal continued forward and circled around her once at close range. Concerned about the animal's behavior, Officer Mullin moved toward the building, only 5 paces away. As she turned to reach for the door handle, the circling wolf stepped toward her and grabbed her sleeve near her free hand. Officer Mullin tried to pull away, but the wolf held on and for a few seconds Mullin found herself in a "tug of war." Alarmed, she let out a short scream and the wolf released its grip. Officer Mullin entered the building and the wolves left the area.

Officer Mullin had not fed the wolves, nor did she have food with her. Garbage from the Tanquary camp was stored inside and was burned each day. Officer Mullin had no reason to believe wolves obtained food from the Warden's camp, but she believed that photographers occasionally fed wolves to enhance photographic opportunities, despite official warnings against such activity. In addition, she reported that wolves ranging outside of the park near the military and weather installations of Alert and Eureka commonly obtained food from open garbage dumps and also were occasionally fed directly by people near Eureka. The behavior of the wolves that approached Officer Mullin strongly suggests they were food conditioned to approach people. The wolf grasping Mullin's sleeve was likely an exaggerated approach response similar to those described in other cases where wolves failed to receive expected food handouts (Cases 1, 9, 10, 11 and 12).

Source: Tabitha Mullin, Nunavut Department of Sustainable Development, Resolute Bay, Nunavut, personal communication.

CASE 6 — Algonquin Provincial Park, Ontario, 1994.

During summer 1994 numerous campers reported encounters with a fearless wolf in the Opeongo-Lavieille area of Algonquin Park. The wolf was reported to be uninterested in food but growled at people in an aggressive manner, tore up camping gear, and eventually bit 2 people. The wolf acted aggressively toward individuals but not when confronted by 2 or more people.

The first biting incident occurred on 3 August when a 9-year-old boy, returning from the latrine to his campsite, confronted the wolf alone about 7:30 PM. The boy ran and the wolf chased, grabbing the boy in the side and inflicting a single puncture wound. The boy's father responded to the child's shout and harassed the wolf away, but the wolf stopped within 2 m and

stood watching the boy. Then on 1 September a woman emerging from her tent turned back when her companion called to her from inside. As she turned, the wolf approached and bit into the back of her leg, inflicting a single puncture wound. The woman crawled inside the tent and the wolf began tearing into camping gear stored at the back of the tent. The wolf was eventually killed; it tested negative for rabies.

Growling at people suggests a defensive agonistic behavior, but the 2 biting incidents appear much more assertive and were initiated by the wolf without aggressive provocation by the people. However, in both cases, the wolf bit after the people had turned and were moving away from the wolf at close range. The behavior of chewing items of human clothing or ripping camping gear is documented frequently from various locations where wolves became habituated to people (Cases 1, 4, 52, 53, 54, and 58).

Source: Algonquin Provincial Park 1997.

CASE 7 — Great Falls, Manitoba, ca 1990.

In the early 1990s Stuart Jansson of Great Falls, Manitoba was setting muskrat traps along a lakeshore in southeastern Manitoba during late November. Just before dark he was returning to his vehicle and found where a wolf had recently killed a deer on the ice. Tracks and drag marks indicated the wolf had moved the deer into a nearby stand of balsam fir. Jansson followed the tracks, but shortly after entering the trees he was stopped by a loud growl that emanated from behind tree boughs only 5 m away. There was insufficient light to see, and Jansson immediately retraced his steps into the open. The following day he returned to the same site and found the area completely packed with the tracks of 4–5 wolves. Scattered hair and a piece of the lower jaw were all that remained of the deer. Apparently, the trapper had walked directly up to the fresh kill the previous night, and a wolf guarding the kill, rather than retreating, emitted the growl as a threat.

Biologists commonly visit wolf kill sites during field studies, but wolves rarely attempt to defend the kill. The aggressive threat displayed in this case may be related to both the freshness of the kill and the time of day.

Source: Stuart Jansson, Great Falls, Manitoba, personal communication.

CASE 8 — Algonquin Provincial Park, Ontario, 1987.

In summer 1987 a wolf briefly bit and inflicted a minor abrasion on the arm of a 16-year-old girl after the girl aimed a flashlight into the wolf's eyes at close range. The incident occurred at a campground and park personnel interpreted the behavior as a “disciplinary” or “annoyance” reaction similar to behavior a wolf would exhibit with another wolf. The wolf was killed and tested negative for rabies.

This incident was the first of 5 in Algonquin Park between 1987 and 1998 in which fearless wolves bit people. In all of the cases, the offending wolves had established regular patterns of fearless behavior for weeks before the biting incidents occurred.

Source: Algonquin Provincial Park 1997.

CASE 9 — Key Lake Mine, Saskatchewan, 1984.

In the mid-1980s wolves fed from open garbage pits near a uranium mine in northern Saskatchewan. Trapping and hunting of wolves was prohibited near the mine and wolves became

food-conditioned and habituated to humans. A wolf-human encounter from 1984 clearly illustrates behavior of a food-conditioned wolf.

A workman was walking along a mine site road carrying his lunch bag in one hand. A wolf approached the man from behind, and in an attempt to get the lunch bag, the wolf grabbed the man's sleeve. The man shoved the lunch bag into the wolf's face causing the wolf to release its grip but not to retreat. With the wolf nearby, the man climbed onto a culvert and remained there until a passing truck stopped. The wolf then moved off and the man hurried to the safety of the vehicle.

Source: Tim Trottier, Saskatchewan Environment and Resource Management, La Ronge, Saskatchewan, personal communication.

CASE 10 — 5-Mile Camp, Alaska, 1975.

This case and the 2 that follow, describe 3 of the approximately 10 incidents (Follmann et al. 1980) in which wolves inflicted minor bites on workers during the construction of the trans-Alaska pipeline. During the mid-1970s wolves commonly received food handouts from construction workers and truck drivers along the pipeline. Those practices contributed to habituation and food-conditioned approaches.

A construction worker had been feeding pieces of sausage to a wolf. As the man placed a piece of meat into his own mouth the wolf leaped toward the man's face, apparently in an attempt to obtain the food. The wolf's teeth closed around the man's nose and mouth, causing superficial abrasions. This wolf was thought to be involved in another biting incident involving a different worker. The wolf tested negative for rabies.

Source: Alaska State Virology Laboratory, Fairbanks, Alaska, unpublished files 1971–2000; and Don Ritter, Alaska State Virology Laboratory, personal communication.

CASE 11 — Prudhoe Bay, Alaska, 1975.

A man was walking at the pump station site on the trans-Alaska pipeline when a wolf rapidly approached and bit him. Both of the man's hands were inside his coat pocket, but the wolf grabbed the man's left hand through the coat, inflicting a minor abrasion. The wolf tested negative for rabies.

Source: Alaska State Virology Laboratory, Fairbanks, Alaska, unpublished files 1971–2000; and Don Ritter, Alaska State Virology Laboratory, personal communication.

CASE 12 — Prospect Creek, Alaska, 1974.

In what was described as an unprovoked attack at a pipeline construction camp, a wolf bit a worker on the right forearm causing dermal bruises but no apparent breaks in the skin. The wolf was killed and tested negative for rabies.

Source: Alaska State Virology Laboratory, Fairbanks, Alaska, unpublished files 1971–2000; and Don Ritter, Alaska State Virology Laboratory, personal communication.

CASE 13 — Superior National Forest, Minnesota, 1970.

Two loggers, accompanied by their dog, were cutting logs in northern Minnesota during December when they saw 2 wolves chasing a deer. When the deer stopped nearby, the men waved their arms and frightened the wolves away, but one of the wolves soon returned and

attacked the dog that was standing near the men. The wolf eventually backed off and one of the men picked up the dog. Then the second wolf charged back and leaped at the dog, hooking a canine tooth in the man's wool jacket, and tearing a 15 cm rip. The wolf then retreated.

The men reported the wolves' aggression was focused on the dog, rather than at themselves, but in similar cases wolves have acted aggressively toward people that were accompanied by dogs (Cases 2, 3, 14, 23, and 25).

Source: Mech 1990.

CASE 14 — Coppermine River, Northwest Territories, 1915.

Early on the morning of 10 February, a female wolf entered the camp of the Canadian Arctic Expedition and began fighting with sled dogs that were staked beside the expedition's tents. Five men came out of the tents and attempted to drive the wolf away. The owner of the dog team ran toward the wolf trying to scare it, but the wolf charged him. The man flapped a shirt at the wolf and it retreated behind a dog sled. A second man, Diamond Jenness, threw a rock at the wolf, whereupon the wolf dodged and ran at the man attempting to bite his leg. Jenness grabbed the wolf by the back of the neck, but the wolf turned its head and bit into the man's forearm. Jenness attempted to choke the wolf with his other hand, and the wolf released its grip then moved a short distance away where it was immediately shot by another member of the party.

Jenness (1985) speculated that the wolf first entered camp because it was, "in heat ...and was seeking a mate among the sled dogs." Further, he speculated that the attempts of the men to drive it away provoked the attack.

Although the wolf may have been in a state of proestrus, it was probably not in breeding condition. Wolves in northern Canada and Alaska normally whelp between late April and mid-May. Therefore breeding takes place in late February to mid-March and the Jenness attack occurred approximately 2–4 weeks before the breeding season. This incident occurred in an area where rabies is enzootic in arctic foxes (*Alopex lagopus*); therefore, the wolf may have been rabid. However, the wolf was not tested for rabies, and despite a serious wound to his arm that bled profusely and exposed underlying muscle tissue, Jenness recovered from the bite without ill effect. In addition, Jenness (1985) rejected rabies as a cause of the attack because one of the members of the expedition was a prominent mammalogist, Dr Rudolph Anderson, who presumably would have recognized and noted any behaviors indicating the wolf was rabid. Nevertheless, in the early stages of rabies, symptoms of the disease may not be readily apparent and being bitten by a rabid wolf does not always result in the victim contracting the disease (Cases 47 and 48). In addition, the wolf's persistent and repeated attempts to attack, after being driven away, is a characteristic often seen in rabid wolves (Cases 40–51)

Source: Jenness 1985.

Predation

Many cases reviewed in this case history contain some behavioral actions that could be interpreted as predaceous, but only the following 3 appear to be clear cases of predation. All 3 involved small children and 2 involved wolves that were habituated to people. In each case multiple elements of predation are apparent, including orientation toward the prey, stalking, chasing, biting, and carrying.

CASE 15 — Icy Bay, Alaska, 2000.

In a remote logging camp, 2 boys ages 6 and 9 were playing behind the camp school on the edge of the surrounding forest on 26 April. A wolf emerged from the trees within 3 m of the boys in a crouched position, showing its teeth. One of the boys reported the wolf growled. The boys initially did not move, but when the wolf stepped closer the boys ran across an open gravel pad toward their homes. The younger boy was wearing oversized boots and was only able to stumble forward in a half run, eventually falling to the ground after traveling about 40 m. Once the boy fell, the wolf attacked, biting the boy in the buttocks and lower back, inflicting 19 lacerations and puncture wounds. When rescuers arrived seconds later throwing rocks and shouting, the wolf picked the boy up and attempted to carry and then drag him into the trees. Eventually, the wolf was separated from the boy when the wolf dropped the boy to regrip and a dog (male Labrador retriever) intervened between the wolf and the boy.

About 10 minutes later the father of the older boy entered the forest and blew on a predator call. The wolf emerged from the trees onto a trail about 80 m away and the man fired a single shot from his rifle killing the wolf. The wolf tested negative for rabies and distemper. A necropsy of the carcass indicated the wolf was in good condition with a normal amount of interior body fat and no apparent physical injuries; however, the wolf was small relative to other wolves in the area. The entire carcass was not weighed but its weight was estimated to be 35 kg. The boy was transported to Yakutat and later to Anchorage for treatment. He recovered from his injuries.

The wolf, a 5-year-old male, had been radiocollared 4 years earlier approximately 160 km west of the attack site and was commonly seen near the Icy Bay logging camp beginning in 1999. In April 1999 the wolf was sighted at a road turnout where a log truck driver had been seen throwing food to an uncollared wolf the previous day. Therefore, it seems likely the collared wolf had received food from people at the same site, but based on the investigation following the attack, there was no evidence the wolf had been fed or had obtained food from people after April 1999.

When seen by camp residents during summer 1999, the wolf was often standing or moving along the edge of the camp perimeter and would retreat into the forest when approached. The wolf appeared to use a natural travel route on the edge of the camp to transition between inland foraging areas and the nearby beach. During April 2000, in the last days prior to the attack, the wolf had shown increasingly fearless behavior, occasionally traveling through the camp and ignoring camp residents. However, the wolf had never approached or acted aggressively toward people before its attack on the boy.

Source: Alaska Department of Public Safety 2000; Marc Cloward, Alaska Department of Public Safety, personal communication; Phil Mooney, Alaska Department of Fish and Game, personal communication.

CASE 16 — Algonquin Provincial Park, 1998.

In June visitors reported frequent sightings of a fearless wolf near Two Lakes in Algonquin Park. Four wildlife students interacted with the wolf for over 40 minutes and they described the wolf as, "...cautious and curious, never frightened. It seemed to genuinely be enjoying its contact with us, as a dog might." The students described the wolf as imitating their behavior, slowly approaching within a few meters then jumping away before starting all over again.

Possibly, the wolf scavenged food from camping and picnic areas, but park officials found no evidence that the wolf had been fed, or that people had seen the wolf eating human foods. Throughout the summer the wolf was sighted almost daily, probably by thousands of people.

Campers, who were thrilled to see a wild wolf so close, reported the wolf was unconcerned by the presence of people. However, the wolf was aggressive toward dogs on at least 4 occasions.

In late September the wolf's behavior suddenly changed when it stalked a man and woman walking with their 4-year-old daughter; the wolf appeared to be intent on approaching the child. The parents blocked the wolf's attempts to reach the child and sprayed it with pepper spray but could not discourage the wolf's approach. When the child and her mother finally found refuge in a nearby trailer, the wolf lost interest and left.

Two days later the wolf emerged from the brush and walked into the Two Rivers campground where another couple with 2 children were packing to leave. One of the children, a 19-month-old boy, was sitting on the ground 6 m from his father. The wolf grabbed the small boy by the rib cage and tossed him about 1 m; the mother immediately picked the child off the ground and climbed atop a picnic table. The father and other campers confronted the wolf and drove it away. The boy was treated for several puncture wounds on his chest and back. Park officials concluded the attack appeared to be a case of attempted predation.

The male wolf was found and killed the same day. Rabies tests were negative, and in all other respects the wolf appeared normal. The wolf had a DNA profile typical of local wolves and therefore, was probably not a captive or hybrid wolf.

Wolves bit people in 4 other instances in Algonquin Park between 1987 and 1996. However, this fifth case represents the only case where elements of predation were clearly present. In all 5 cases the wolves exhibited habituated behavior toward people prior to inflicting bites. At that time, park officials estimated that roughly 12 wolves had exhibited noteworthy, habituated behavior since the early 1970s; 4 of those wolves eventually were involved in biting incidents.

Source: Algonquin Provincial Park 1999.

CASE 17 — Koyukuk River, Alaska, ca 1900.

In his book *Shadows on the Koyukuk*, Sydney Huntington tells the story of David Tobuk, a river captain who ran the steamboat *Teddy H* along the Koyukuk River in the early 1920s. As a toddler Tobuk was playing along the edge of the Koyukuk River when a wolf ran from the brush and grabbed him by the head and carried him off. A man who witnessed the attack took a rifle and gave chase, shooting the wolf and saving the child. Tobuk carried a large scar on his face for the rest of his life suggesting the wolf severely bit into the young boy's head.

This case which occurred about 1900, could be considered to be out of context relative to current wolf management concerns. However, the remote and somewhat primitive conditions under which this event occurred are similar to conditions in remote areas of Alaska and Canada today where rural residents are surrounded by habitat and wildlife conditions that remain largely unaffected by man.

Source: Huntington 1993.

Prey Testing-Agonistic Charges

In cases in which wolves have made rapid, apparently aggressive, charges or leaps toward people in remote areas, it is difficult to identify the motivation for such behavior. It may be the result of wolves misidentifying people as prey, the actions of naïve wolves testing unfamiliar prey, or it may be an agonistic response in which, for whatever reason, wolves feel compelled to aggressively drive people away. In the following 8 cases, wolves displayed aggressive approach

behavior and the people involved defended themselves at close range. None of the wolves in these cases was known to be food conditioned, habituated, or rabid.

CASE 18 — Joshua Green River, Alaska, 1997.

In October 1997 big game guide and commercial pilot Andy Greenblatt was guiding 2 bear hunters near the western tip of the Alaska Peninsula, a remote area where wolves rarely encounter people. The 3 men were sitting on a small knoll a few hundred yards from their campsite when Greenblatt decided to return to camp to retrieve his canteen. The guide was in open country and walking along a well-worn game trail when he sighted a trotting wolf 75 m away, angling toward the trail. When the wolf intersected the trail it looked directly at Greenblatt, and then with its ears up, broke into a run. The man yelled and waved his arms, the wolf's ears laid back for a few steps, but the animal continued to run and to stare directly at Greenblatt's face. As the wolf approached at a full run Greenblatt fell to one knee, raised his rifle, and fired when the wolf was less than 1 m from the end of the barrel. Although the bullet passed over the wolf's head, the muzzle blast from the large caliber rifle (.338 win) knocked the wolf off line. Greenblatt jumped to his feet and swung his rifle, striking the wolf in the head with the rifle butt. The wolf staggered off a few feet, briefly glanced back, and then trotted away across the tundra and out of sight. Greenblatt described the wolf as "relatively small," possibly a yearling.

Greenblatt's first assumption was that the wolf was rabid because he assumed healthy wolves never approached people and because he was in an area where rabies was enzootic in red foxes (*Vulpes vulpes*). However, the wolf showed no sign of physical disability and immediately abandoned the encounter and fled once it was struck by the rifle. In cases where rabies is diagnosed (Cases 40–51) wolves often approach repeatedly, even after being struck or harassed away.

Source: Andy Greenblatt, Wright Air Service, personal communication.

CASE 19 — Whale Cove, Northwest Territories, 1985.

On 13 December biologists Robert Mulders and Mark Williams were capturing barren-ground caribou about 65 km southwest of Whale Cove, a small community on the west coast of Hudson Bay in what is now the territory of Nunavut. At 1:40 PM they captured an adult female caribou with a skid-mounted net gun from a Bell 206B helicopter and landed to process the animal. As they knelt over the netted caribou, Mulders noticed an approaching wolf at a distance of 200 m. The helicopter engine was still running, but the wolf ran within 10 m of the spinning tail rotor as it approached the men. Both men stood, shouted and stepped toward the wolf waving their arms. As Mulders took several strides toward the wolf, it moved to their right in a low stalking crouch. When the men turned and faced the wolf, it circled around further to the right, as if to outflank them. Mulders, who was closest to the wolf, maintained direct eye contact and took a step back and to the right as the wolf came within a few meters. The wolf quickly moved in and grabbed Mulder's left leg, just below the shin. Mulders leaned over and struck the wolf in the head with his bare fist, but the wolf maintained a firm grip for about 10–15 seconds. Williams then stepped forward and struck the wolf on the head with a caribou radio collar, knocking the wolf unconscious. Mulders subsequently struck the wolf twice on the top of the skull with the collar and punctured the wolf's chest cavity with a knife. The wolf's bite caused a small 4 cm tear in Mulders' wind-pants and a small lesion to his shin.

External examination of the carcass indicated that this female pup (about 7 mo of age) was in reasonably good body condition and weighed an estimated 22 kg. Traces of dried blood on its right shoulder suggested it might have fed within the previous few days. The head was sent to a lab for rabies testing. Rather than risk possible rabies contamination, the remainder of the carcass was burned without any attempt at necropsy. The wolf tested negative for rabies.

The men believed the wolf intended to prey upon the caribou and had probably not previously encountered people. Given its age, the wolf was probably inexperienced in catching and killing large prey. It is possible that the wolf had witnessed the caribou capture sequence and was visually stimulated, but it was unusual that the wolf was not deterred by the noise of the helicopter's turbine engine. Given the wind direction, the wolf would have scented the men and caribou only at close range. Williams speculated that Mulder's movement back and to the right as the wolf was circling may have elicited an aggressive response by the wolf. However, Mulder's interpretation was slightly different. He described the final movement by the wolf as follows: "The wolf had come in close, within several (perhaps 4) meters then moved around in a wider circle to the right, in a low crouched posture. I maintained steady eye contact with the animal over the entire period, and I believe the wolf was already determined to get in close to me. I'm not convinced that my shifting back and turning to the right by one or two paces is what actually provoked the wolf to run in and grab my leg. It was probably already intent on dealing with me prior to my shifting to the right. Obviously, it's difficult to assess what the wolf's motives were."

Source: Robert Mulders, Wildlife and Fisheries Division, NWT Ministry of Resources, Wildlife and Economic Development, Yellowknife, Northwest Territories, personal communication; and Mark Williams, British Columbia Ministry of Water, Land and Air Protection, Smithers British Columbia, personal communication.



Biologists Robert Mulders and Mark Williams process a live-captured caribou near Whale Cove, Nunavut. A few minutes before this photo was taken, the wolf in the foreground approached and bit Mulders in the leg. The wolf was knocked unconscious with the caribou radio collar and then killed with a knife. The wolf tested negative for rabies (Case 19). Photo courtesy of Robert Mulders.

CASE 20 — near Duluth, Minnesota, 1982.

A 19-year-old man was hunting hares in thick cover in northern Minnesota during January. He saw a movement ahead, and then he was attacked and knocked down by a wolf. He rolled on the ground with the animal, holding it away by grabbing its throat. The young man discharged his .22 rifle and the noise of the shot apparently frightened the wolf away. The wolf did not bite, but scratched the man's thigh with its claws.

Mech (1990) speculated this incident occurred because the wolf mistook the young man for a deer in the thick cover. The hunter's clothes were laced with buck scent and that, coupled with the hunter's movements, may have stimulated the attack.

Source: Mech 1990.

CASE 21 — Ellsmere Island, Nunavut 1977.

Paleontologists J Hutchison and M Dawson were conducting fieldwork on Ellsmere Island on 29 June. They were sitting on the rim of a canyon when they sighted a pack of 6 wolves foraging along a shoreline 120 m below. One of the wolves detected the scientists and the pack began moving up the slope toward them. When the wolves were within 5 m, the man and woman stood, and Dawson threw her pack toward the wolves. The wolves continued to press their approach as Hutchison and Dawson retreated a short distance down slope for better footing and for access to several large clods of mud. Munthe and Hutchison (1978) described the wolves' actions as follows: "The wolves continued toward us, while we shouted and threw clods in their direction. The animals halted 3–4 m from us. Most of the wolves trotted from side to side within about a 3-m space for a few seconds, and then one attempted to circle behind us but turned when a clod landed near it. One wolf then took the lead and, looking Dr Dawson directly in the face, walked steadily forward, ignoring our poorly aimed clods. Its ears were erect and its mouth closed or just ajar. When approximately 1.5 m away, the wolf leapt toward Dr Dawson's head. At the leap, Dr Dawson leaned back, arms forward but near the body, and uttered a small cry. The wolf grazed her cheek, leaving it wet with saliva, then dropped to the ground, turned, and with a few backward glances, retreated." All 6 wolves then moved away without further incident. None of the wolves had vocalized during the incident or exhibited other threat displays. However, after the encounter, the wolves traveled to Hutchison's and Dawson's camp and dug into a shallow latrine.

In evaluating the encounter Munthe and Hutchison (1978) speculated it was related to testing of unfamiliar prey. However, they also mention that they had no knowledge of the wolves' history with other people. Case 5 is strikingly similar to the one described by Munthe and Hutchison and also involved a pack of wolves on Ellsmere; however, the wolves described in Case 5 were likely food conditioned. It is possible that the wolves encountered by Munthe and Hutchison had previously received food handouts and were displaying a food-conditioned approach.

Source: Munthe and Hutchinson 1978.

CASE 22 — Salcha River, Alaska, 1976.

In summer 1976 Roy Lawrence and his 7-year-old son David were flown into a remote landing strip near the Salcha River in Interior Alaska. Roy and pilot Ed Galvin stood next to the airplane talking while David walked to the edge of the river and crouched to play in the water, only 30 m from his father. Movement about 50 m from David caught Roy's attention, and he saw

a wolf running directly toward his son. Roy yelled at his son, telling him to lie down in the willows; David immediately complied. Having lost sight of the boy, the wolf stopped and stood on its hind legs looking over the brush in the boy's direction. In the meantime, Galvin withdrew his loaded rifle from the airplane and immediately shot the wolf twice, killing it a short distance from the boy. Galvin, an experienced hunter, identified the wolf as a young female and estimated her weight at 32 kg; both men thought the wolf looked emaciated.

Wolves in Interior Alaska commonly prey on caribou and moose calves during early summer, and it is easy to imagine how the boy's crouched form and movement near the water's edge could have been perceived by the wolf as potential prey. The wolf's apparent disregard for the 2 men and the airplane is surprising, but similar to other incidents where healthy wolves have stalked toward people, ignoring nearby aircraft and bystanders (Cases 19, 78, and 79). Apparently, during a stalk, a wolf's concentration on potential prey is so focused that peripheral stimuli, even if unfamiliar, are sometimes ignored.

Source: Roy Lawrence, Haines, Alaska, personal communication.

CASE 23 — Tonzona River, Alaska, 1975.

Bob Piorkowski and his wife lived on a remote homestead in Interior Alaska near Denali Park. One October evening just before dark they heard their dog persistently barking near a hill about 75 m from their cabin. Piorkowski thought the dog was barking at a moose, and hoping to get a shot at the moose, the couple took a rifle when they went to investigate. As they approached the dog, the Piorkowski's saw 5 wolves running down the hill taking long, leaping bounds. The wolves appeared focused on Piorkowski and his wife, rather than on the dog that stood alone about 5 m away. Suddenly realizing that the wolves were attacking, Piorkowski brought his rifle level and fired from the hip, striking the lead wolf in the chest and killing it at point blank range directly in front of himself. He fired at a second wolf less than 10 m away, killing it as well. The other wolves retreated up the hill.

The presence of the dog, and the dog's barking prior to the attack, raises a question as to the intended target of the wolf attack. Although territorial defense may have been a motivating factor in this incident, the presence of 2 people did not inhibit the wolves' charge and when fired upon, the wolves seemed focused on the people rather than upon the dog. Bob Piorkowski was experienced with wolves, and at the time of the attack he was assisting on a wolf research project within Denali Park. He described the lead wolf as exceptionally large, probably the alpha male. He kept the hide and it was later mounted into a life-sized mount.

Source: Dr Bob Piorkowski, Alaska Department of Fish and Game, personal communication.

CASE 24 — Wien Lake, Alaska, circa 1969.

Alex Lamont lived alone in a dugout cabin on the shore of Wien Lake, Alaska. Once each month, bush pilot Al Wright landed at Wien Lake to deliver Lamont's provisions. On one of his supply runs in the late 1960s, Wright received 2 dried and stretched wolf hides from Lamont who asked Wright to fly the hides to Fairbanks and collect the bounty. Lamont then told Wright that he had been attacked and bitten by one of the wolves about 2 weeks earlier. According to Lamont, he was walking near his camp when he saw the 2 wolves running toward him. As the wolves approached he drew a pistol and fired, killing the first wolf after it had grabbed him, torn through his pants, and inflicted a bite wound on his leg. The second wolf was nearby and Lamont

shot it at close range. Wright reported that when he landed at Lamont's cabin, about 2 weeks after the incident, the bite wound had mostly healed and that Lamont never suffered long-term ill effect from the bite.

A bounty paid on wolves in Interior Alaska during the early 1960s was repealed in 1968. Upon returning to Fairbanks with the hides, Wright discovered that the bounty had been repealed the previous winter. Both he and Lamont were previously unaware of the change in the bounty. Wright reported that the hides were small and of little value without the bounty, so he discarded them. The timing of the change in bounty regulations indicates the wolf attack on Lamont occurred in summer 1969, the first summer in which there was no bounty on wolves in Interior Alaska.

Source: Al Wright, Fairbanks, Alaska, personal communication.

CASE 25 — Northern Saskatchewan, ca 1950.

Tim Trottier described an encounter between a pack of wolves and his late father-in-law, Thomas Hamilton. The event occurred in the late 1950s in the Lower Foster-Saint Lakes area of northern Saskatchewan, about 160 km north of La Ronge.

Hamilton was traveling by dog team and while crossing a lake, spotted several wolves about 1–1.5 km away lounging on the snow-covered ice. The trapper headed for the cover of a nearby island, tied up his dogs, and taking his rifle, stalked through the brush to get closer. At the end of the island he was about 500 m from the wolves. While Hamilton watched from the brush, one of the wolves stood up and looked intently in the direction of the island. Then the rest of the pack suddenly rose to their feet. Thomas had the first wolf in his sights and was about to fire when the pack began running directly at him. He waited for a better shot, expecting the wolves to stop, but they came fast and almost ran over him, bounding through the brush on either side. He managed to shoot the lead wolf at point blank range and fired more shots before the remaining wolves disappeared behind him. Concerned about his dogs, the man ran back to the other side of the island where he found the dogs all resting quietly, curled up in the deep snow. The dogs had apparently not detected the wolves.

Like the Piorkowski case (Case 23), dogs were present nearby when wolves charged toward Thomas Hamilton. Hamilton believed the wolves had mistaken him for a moose or caribou, but the presence and scent of the dog team certainly could have been a factor in this case, even though the dogs were hidden from the wolves' view.

Source: Tim Trottier, Saskatchewan Environment and Resource Management, La Ronge, Saskatchewan, personal communication.

Self-Defense

Defense of Den Sites, Rendezvous Sites, or Conspecifics. When people approach dens or rendezvous sites wolves commonly react by howling and barking, and they may briefly charge toward the intruders. As illustrated in the following accounts, the intensity of the threat behavior near dens or rendezvous sites is variable. Undoubtedly this behavior is related to the defense of pups, but wolves sometimes exhibit similar behavior when defending disabled or even dead pack mates. Cases 26–35 describe several encounters where wolves were defending dens, rendezvous sites, or disabled conspecifics.

CASE 26 — Candle Lake, Saskatchewan, 2000.

In July, biologist Ed Kowal and 2 other biologists landed by helicopter to retrieve a radio collar from an elk that had been killed by wolves about 15 km southwest of Candle Lake, Saskatchewan. The helicopter landed in a clearcut about 300 m from where the collar lay in a stand of black spruce. As the biologists walked into the thick stand of trees, they saw an adult female wolf about 20 m ahead. The wolf was staring at them with the fur on its back erected. Kowal grabbed a large stick from the ground and as he advanced he struck the stick against a tree believing the noise would frighten the wolf. Instead the wolf stood its ground and began to growl. After about a minute Kowal again walked toward her with the stick raised, and when he approached to within 15 m the wolf slowly moved away and out of sight into the trees. Several other wolves could be heard howling ahead of the biologists. After finding the elk collar near a wolf den, the biologists returned to the helicopter without seeing the wolves, but the wolves continued to howl nearby.

Source: Ed Kowal, Saskatchewan Environment and Resource Management, Prince Albert, Saskatchewan, personal communication.

CASE 27 — Ketchikan, Alaska, 2000.

Three deer hunters were traversing a steep creek bottom near Ketchikan, Alaska when 3 wolves suddenly appeared, running toward them. The wolves stopped at 30 m and then began pacing as they barked and howled. The hunters immediately retreated but reported they heard high-pitched yips and howls coming from behind the 3 adult wolves, suggesting pups were nearby. The timing of this incident suggests the hunters had stumbled upon a late summer rendezvous site, which the wolves defended.

Source: Boyd Porter, Alaska Department of Fish and Game, personal communication.

CASE 28 — Bella Bella, British Columbia, 2000.

On 27 September at 6:20 PM, a biologist was videotaping wolves on an island near Bella Bella, British Columbia. A group of 4 pups and 3 adults were resting in a grassy meadow near an estuary where wolves commonly fed on salmon. The wolves were in the open, and the biologist was 100 m away, partially obscured by brush. Initially, the wolves did not react to the man's presence, but eventually some pack members began looking toward his location. Suddenly, the alpha female focused on the man, raised her tail to a $\frac{3}{4}$ -high position, raised her head, and began a hopping charge that threw debris into the air behind her as she jumped forward driving her legs against the ground. She broke into a stiff-legged lope with tail raised and stopped about 50 m from the man; she urinated and scratched the ground with her paws. For 3 minutes the wolf cautiously and slowly moved from right to left and back to the left in front of the biologist. At one point a pup briefly joined her, but the pup appeared not to notice the man.

The female wolf then began a slow, walking circle frequently sniffing the ground and glancing over her shoulders in all directions in what appeared to be an inhibited, cautious stalk. She circled the biologist 180 degrees to the left and approached him from behind, where tree branches partially concealed her from his view. When about 20 m behind him she stopped, defecated, and then scratched the ground with her front paws. Then she circled to the right, her posture and behavior alternating between cautious and assertive, with her tail alternately straight out and then down in the $\frac{1}{4}$ -low position and sometimes hanging. When directly in front of Darimont, she stepped toward him and scratched the ground with her front paws while holding

her tail straight out. She then urinated with a raised leg and raised her tail to $\frac{3}{4}$ high. That assertive posture lasted only a few seconds then she continued to hesitantly pace in front of the man for about another minute. A raven flying overhead seemed to intimidate her; she lowered her ears, ducked her head, and looked up when the bird flew past. Then with her head lowered and pushed forward and her tail out straight, she cautiously stepped closer. Darimont said "Hey Wolf" in a calm tone; the wolf jumped back turning in the air. Her tail went to the low position, and when the raven flew over and croaked loudly, she tucked her tail between her legs. She stood broadside for a few seconds looking back toward the pups, and then walked away, briefly stopping to glance back. Once she was about 50 m from the biologist, she straightened her tail and returned to the pups. Darimont left the area shortly thereafter, but the wolves did not appear disturbed by his movement.

There are no permanent human residents on many of the islands in the Bella Bella area. The wolves are subjected to light hunting and are not known to be food conditioned or habituated to people. The urinate, defecate, ground scrape sequences and assertive posturing exhibited by the alpha female was an interesting territorial display not otherwise reported in this case history. However, the charging gait appears in other encounters with wolves near den or rendezvous sites, but in those cases aggressive behavior is normally associated with frequent vocalizations; in this case it was not.

Source: Chris Darimont, University of Victoria, British Columbia, personal communication.

CASE 29 — Prince of Wales Island, Alaska, 1995–2001.

Between 1995 and 2001, Dr Dave Person conducted a study of wolf den sites in Southeast Alaska. Field crews visited 16 active wolf dens and inserted an infrared video probe into den cavities to view and count pups. At least one adult wolf was present at each den when biologists approached. Dr Person described the wolves' behavior as follows: "Generally, wolves would bark and howl and frequently approached biologists to within 10–15 meters. As wolves approached they often trotted directly toward the biologists or darted between intervening cover while approaching. In some cases, usually when a lone wolf was present, wolves would move 50–100 meters from the den and howl. Reaction by wolves was most intense when observers first reached dens, but eventually the wolves would move away and maintain a vigil from a greater distance. When field crews left the den sites, the wolves generally followed, barking and howling until the biologists were up to a kilometer from the den."

Dr Person reported that he and the other biologists did not feel threatened by the wolves' behavior, but the willingness of wolves to closely approach people while loudly vocalizing illustrates an agonistic defense behavior that is uniquely characteristic of wolf responses to human intrusions at den and rendezvous sites during spring and summer.

Source: Dr Dave Person, Alaska Department of Fish and Game, personal communication.

CASE 30 — 100-Mile Creek, Alaska, 1995.

At 11:00 PM on 5 June, biologist Mark McNay and helicopter pilot Jonathan Larrivee landed approximately 300 m from a wolf den to confirm the presence of pups. The den was located near the top of a small hill that was covered by birch trees. As McNay and Larrivee climbed the hill, the alpha female and another wolf rushed over the top, running in long leaping strides directly toward the men. The wolves veered off about 20 m from the men and the alpha female emitted a loud cough-like bark. The wolves immediately ran into the surrounding trees and circled at a

distance of approximately 100 m. McNay and Larrivee continued to the den and listened at the den entrance. After hearing pups inside, the men walked back to the helicopter. Other than the initial rush, the wolves remained mostly out of sight, but they frequently barked and howled.

Source: Mark McNay, Alaska Department of Fish and Game, unpublished field notes.

CASE 31 — Fortymile River, Alaska, 1994.

In February during a wolf capture attempt from a helicopter, a biologist darted an alpha female wolf. The animal was immobilized, but the capture team couldn't approach because the alpha male aggressively charged each time the helicopter set down. Eventually, the capture team darted and immobilized the male in order to handle the female. This incident is unique in that the aggressive behavior by the male was in defense of his incapacitated mate during winter, rather than in defense of pups at a summer den or rendezvous site. The male had the option of leaving the area and was not being harassed or chased by the helicopter when he first charged toward the crew as they landed. Another, but less aggressive, case of wolves defending conspecifics during winter is described in Case 35.

Source: Patrick Valkenburg, Alaska Department of Fish and Game, personal communication.

CASE 32 — Riding Mountain National Park, Manitoba, ca 1990.

In June Dr Paul Paquet and his wife were making observations of a wolf den in Riding Mountain National Park. They camped on a small island watching a den that was only 50 m away near the shore of the lake. They did not erect a tent but were sleeping in bivouac sacks on the ground. After 7 days of observations they awoke one morning to find the wolves had abandoned the den site. They continued their watch of the den that day, but the wolves did not return. Late in the day the Paquets moved off the island and set up a small nylon tent near the lakeshore about 100 m from the den. A nylon rain fly covered the tent and was anchored to the ground with nylon line. At 1:00 AM the Paquets awakened when wolves began howling nearby. The wolves approached and closely circled the tent growling and barking. They tripped over the lines holding the fly. Paquet exited the tent with a flashlight to drive the wolves away and recognized the alpha female and other members of the pack in the beam of his light. Despite the man's presence outside the tent, the wolves remained within 2–3 m and displayed threatening postures and vocalizations. Paquet returned to the tent and the wolves remained nearby for about 2 hours before moving away.

The next day Paquet found the wolves' new den site about 500 m from the old den. The couple established an observation position about 100 m from the new den but did not erect the tent. They continued watching the wolves for several days and did not experience further threat behavior from the wolves. Apparently, the wolves had become habituated to the Paquets in the original context (i.e., on the island, sleeping in bivouac sacks), but when the tent was erected at a new site it was sufficient stimulus to elicit defensive behavior. However, when the Paquets returned to bivouac sacks to make their observations, the wolves again perceived the people as nonthreatening. Obviously, it was not the people per se that stimulated the defensive response.

Source: Dr Paul Paquet, University of Calgary, Calgary, Alberta, personal communication.

CASE 33 — Ross River, Yukon Territory, 1990.

Al Baer and Bob Hayes, biologists with Yukon Fish and Wildlife Branch, flew by helicopter to a wolf den near the Ross River in the Yukon Territory. It was early August and the wolf pack was using the site as a rendezvous area; the biologists planned to collect scats as part of a food habits study. When the helicopter landed the adult wolves retreated. The biologists heard the adults howling some distance away, but the pups were howling close to the den site. The men responded to the wolf howls with howling of their own and the pups moved closer. As Baer and Hayes approached on foot, the radiocollared alpha female returned and came to the edge of small bluff only 20 m from Baer. The wolf stared at the men and displayed what Baer described as a nervous grin, a mouth gape with teeth exposed. She then turned, disappeared from view, and began barking. The wolves remained in the area for another 10 minutes apparently trying to locate and shepherd the pups away from the biologists.

Source: Al Baer, Yukon Fish and Wildlife Branch, Whitehorse, Yukon, and Bob Hayes (retired), Yukon Fish and Wildlife Branch, Haines Junction, Yukon, personal communication.

CASE 34 — 15 km southeast of Churchill, Manitoba, 1984.

Three biologists hiking through a spruce-lichen woodland had stopped near a small clearing when a wolf suddenly rushed toward them. One of the men shouted and stomped his feet. The wolf attempted to stop but lost its balance and crashed into a bush within 5 m of another member of the party. That wolf then retreated into the forest, but simultaneously a second wolf rushed directly at one of the biologists "...in approximately 2-m bounds, ears up, tail straight out, and its eyes locked onto his." The biologist sounded a hand-held air horn at arms length when the wolf was within 2 m. The wolf diverged slightly in its charge and landed less than a meter from the biologist, and then apparently in response to the horn, the wolf retreated toward the trees.

The 3 biologists immediately climbed into nearby spruce trees as the second wolf paced within 10 m barking and howling. The biologists remained in the trees for 4 hours; more than 30 times they observed 3 different wolves pacing within 15–35 m. Eventually, after no wolves had been sighted for some time, the biologists climbed down and left the area, but they discovered a wolf den of unknown status within 1 km of the clearing where the wolf encounter had occurred.

Later that summer the biologists observed tracks of wolf pups within 3 km of the encounter site. The existence of pups and the proximity to a den site suggests the party stumbled onto a rendezvous or den site that was aggressively defended by the wolves.

Source: Scott et al. 1985.

CASE 35 — Riding Mountain National Park, Manitoba, 1979.

Tim Trottier worked as a wildlife technician on a wolf research project in Riding Mountain National Park, Manitoba. In December Trottier was dispatched to retrieve the carcass of a radiocollared wolf that had died in a remote area. He snowmachined approximately 27 km through deep snow before the machine became mired in overflow at a creek crossing. He abandoned the machine and continued on snowshoes for an additional 5 km before reaching the dead wolf.

Trottier arrived at the wolf carcass late in the day and decided to spend the night rather than attempt to carry the wolf out in the dark. Trottier did not have a tent or sleeping bag, so he built a fire and remained awake most of the night. During the night wolves periodically howled nearby,

and on several occasions Trottier could hear them walking in the brush. The wolves remained close throughout the night, but just before dawn they howled again about 1–2 km away. At daylight Trottier was able to determine by tracks in the snow that several wolves had circled within 100 m of his campfire during the night and had also visited the carcass of the dead wolf that lay nearby. The dead wolf was a pup and Trottier found another dead pup nearby. It was determined from the necropsy that the wolves had died from pneumonia and distemper.

This case contains many behavioral elements often exhibited by wolves defending a den or rendezvous site, but it occurred during midwinter. Apparently the pack was defending the remains of the wolves that had died near Trottier's bivouac, or possibly other sick and weakened wolves that may have been nearby. The fact that both wolves had succumbed to disease suggests they had been lying at that site in a weakened state for some time before dying. That situation may have contributed to the pack's defensive behavior.

Source: Tim Trottier, Saskatchewan Environment and Resource Management, La Ronge, Saskatchewan, personal communication.

Provoked Aggression in Self-defense. When wolves are aggressively pursued they may resort to aggressive behavior that could result in human injury. Wolves probably resort to aggressive charges in self-defense when other avenues of escape are not available. The following 4 cases (Cases 36–39) describe aggressive wolf behavior witnessed by biologists during wolf capture efforts.

CASE 36 — 24 km southeast of Ely, Minnesota, 2000.

In August wildlife technicians Michelle Szepanski and Paul Frame were checking wolf traps in northern Minnesota as part of a research project with the Biological Research Division of the US Geological Survey. Near a highway they found a wolf caught by its front foot in one of their traps. The Newhouse #14 trap was attached to a length of chain that was secured to an iron hook drag. The drag was entangled in the brush, and as Frame circled the wolf to administer the immobilizing drug with a jab stick, Szepanski stood near the road to dissuade the wolf from moving in that direction. As Frame approached, the wolf pulled the drag free and began running parallel to the road. With arms outstretched, Szepanski moved toward the wolf in an attempt to haze it into the brush. When the drag caught, the wolf tumbled to a stop. After regaining its feet, the wolf looked at Szepanski, charged, and leaped with open jaws toward her face. The wolf reached the end of the chain and snapped its jaws closed, brushing its teeth across the woman's shirt. The wolf tumbled to the ground as it was pulled back by the chain; Szepanski stepped back and the wolf retreated toward cover where it became completely entangled and was immobilized.

The wolf, an adult female, did not vocalize or act aggressively after its initial charge. Based on the size of the teats, Szepanski and Frame concluded the wolf had been lactating earlier that summer.

Source: Michelle Szepanski, Alaska Department Fish and Game, personal communication.

CASE 37 — Goodpaster River, Alaska, 1998.

From a helicopter, biologist Craig Gardner was attempting to dart an alpha female when the wolf suddenly turned, focused on Gardner, and charged toward the open door of the helicopter. The pilot pulled the helicopter up, but the wolf lunged into the air and caught the helicopter's landing gear with her teeth about an inch behind Gardner's boot. As the aircraft continued to rise,

the wolf was lifted into the air until her teeth slid down the landing gear and struck against a cross piece. The blow knocked the wolf off and it fell about 2 m to the ground, unharmed.

Source: Craig Gardner, Alaska Department of Fish and Game, personal communication.

CASE 38 — Hinton, Alberta 1995 and Fort St. John British, Columbia, 1996.

Among approximately 70 wolf captures conducted from helicopters during January 1995 and January 1996, only 1 wolf charged toward a helicopter. The animal was an old-aged alpha female that, after a short pursuit on an open ridge, turned, charged with a hopping gait, and snarled as it leaped toward the pursuing helicopter. The helicopter withdrew and then approached again. The wolf was darted and immobilized.

Source: Mark McNay, Alaska Department of Fish and Game; unpublished field notes.

CASE 39 — Tanana River Alaska, 1995–2000.

Among 259 wolves that were captured using helicopters in Alaska's Unit 20A between 1995 and 2000, only 2 charged toward the helicopter. Each wolf opened its mouth in a wide gape and snapped it closed in an exaggerated biting motion. Both animals were estimated to be older than 7 years of age.

In the first instance, an alpha female charged and leapt at the helicopter that was hovering only a few meters off the ground. The biologist attempting to dart the wolf was partially outside of the helicopter and thrust his boot downward toward the wolf's open mouth to prevent her from grasping the skid. In the second instance, an alpha male charged but veered away when about 5 m from the hovering helicopter.

Source: Mark McNay, Alaska Department of Fish and Game; unpublished field notes.

Rabies

Rabies is enzootic among foxes in western and northern Alaska, in arctic Canada and in areas of Ontario, Quebec, and Labrador. Human encounters with rabid wolves have been reported from all of those areas. Behavior among rabid wolves is highly variable, as illustrated in the following 12 cases (Cases 40–51), and does not necessarily involve a ferocious attack.

CASE 40 — Trans-Labrador Highway, Newfoundland, 2001.

In June 2001 a wolf attacked 3 vehicles on the trans-Labrador Highway between Churchill Falls and Labrador City-Wabush. Pieces of the vehicles were torn off, lights were broken, and many scratches were apparent from the wolf's teeth and claws. The wolf was eventually hit by a fourth vehicle and dragged itself into the surrounding brush. The wolf's carcass was not recovered for analysis, but a rabies outbreak in red foxes was underway at the time.

Source: Rob Otto, Wildlife Research Division, Department of Tourism, Culture and Recreation, Goose Bay, Newfoundland, personal communication.

CASE 41 — Raymore, Ontario, 2001.

In January an aggressive wolf was reported to have attacked and bitten a dog and a horse near Raymore, Ontario. When the Ontario Provincial Police arrived the wolf attacked the police car, flattening a tire and puncturing the bumper with its teeth. The animal was killed and it tested positive for rabies.

Source: Charles MacInnes, Rabies Unit, Ontario Ministry of Natural Resources, personal communication.

CASE 42 — Labrador City-Wabush, Newfoundland, 1997.

In autumn 1997 reports of a wolf acting strangely in Labrador City-Wabush prompted police to investigate. When they arrived the wolf approached and jumped onto their vehicle. The wolf was killed and tested positive for rabies. A rabies epidemic in red foxes was occurring at the time.

Source: Rob Otto, Wildlife Research Division, Department of Tourism, Culture and Recreation, Goose Bay, Newfoundland, personal communication.

CASE 43 — Ellsmere Island, Nunavat, 1995.

On 22 April 1995, 3 men were bitten by a rabid wolf at the Canadian Forces Base Alert on Ellsmere Island. One man received a 7.5 cm laceration on his knee from the bite; the other 2 men received minor bites. The 3 men were not together, instead the wolf encountered them in separate areas and briefly attacked each man. One man was attacked as he was moving a vehicle out of a garage; the other two men were attacked as they walked between buildings. The wolf was shot with a rubber bullet in an attempt to scare it away, but the bullet ruptured a blood vessel, killing the wolf. The wolf tested positive for rabies; later another dead wolf was found near the base.

Source: Edmonton Journal, 29 April and 30 April 1995.

CASE 44 — Spence Bay, Northwest Territories, 1991.

Gideon Nanook was traveling by dog team in early January, 12 miles from Spence Bay, Northwest Territories. He had stopped to collect water when the dogs began barking at an approaching wolf. The wolf began fighting with the dog team. Nanook jumped on the sled, urging his dogs forward, but the wolf followed. The man stopped and pulled out his rifle, but the rifle jammed. The wolf attempted to attack Nanook, but the hunter moved around the sled keeping the dogs between himself and the wolf. Finally, the wolf charged through the dogs and grabbed the man's parka. Nanook struck the wolf with the rifle, knocking the animal unconscious. Nanook killed the wolf with a knife. The wolf tested positive for rabies.

Source: News of the North, 14 January 1991.

CASE 45 — Huikitik River, Northwest Territories, 1984.

On 9 June biologists Susan Fleck, Doug Heard, and Mark Williams landed by helicopter about 400 m from what appeared to be a wolf den near the Huikitik River west of Bathurst Inlet, Northwest Territories. They started walking toward the den and after a short distance saw what appeared to be a lactating female wolf slowly walking away and turning to look at them as she walked. When the biologists were 100 m from the den a second wolf stood up and began walking

directly toward them. The wolf was injured and had a piece of flesh hanging below its jaw. When the wolf was less than 30 m away, Williams and Heard began shouting, but the wolf walked directly up to Williams and bit at the tripod he was holding in his hands. The wolf pulled on the tripod and Williams pulled back. Eventually, the wolf released the tripod and moved toward Susan Fleck. The animal grabbed the tripod she was holding and pulled it from her hands. Fleck began moving toward the helicopter that was 200 m away. The wolf followed and approached her. She pushed her pack into the wolf's face, and it ripped off part of the pack. Fleck retreated further, but the wolf approached again. This time the wolf took the entire backpack. The sequence was repeated again and the woman hit the wolf in the face with binoculars, then with a camera, and then later with another camera as she continually moved toward the helicopter. Finally, Fleck jumped inside the helicopter as the pilot was starting the engine. Heard, who had reached the helicopter at the same time, pulled out a shotgun and shot once at the wolf but missed; he fired 2 more times knocking the wolf down once, but it regained its feet and began moving back toward Williams who was still some distance away. When it reached Williams the wolf again grabbed the tripod, but Williams was able to fend the wolf off. The wolf finally released the tripod and walked back toward the den site. The biologists boarded the helicopter, flew to the den, and killed the wolf.

The wolf, a large, light-colored male, tested positive for rabies. Heard described the wolf's behavior as debilitated. It had a glazed expression on its face and did not react when struck by the binoculars or the pack. This incident illustrates a mild form of aggression in a rabid wolf similar to that seen by Richard Chapman (Case 46) but strikingly different from the ferocious aggression exhibited by rabid wolves in the cases of Panuekuk Sampson (Case 51) and Mike Dusiac (Case 50).

Source: Mark Williams, British Columbia Ministry of Water, Land and Air Protection, Smithers, British Columbia, personal communication.

CASE 46 — Arctic National Wildlife Refuge, Alaska, 1977.

Biologist Richard Chapman was making observations of a wolf home site on 14 July when he observed a wolf trotting past his tent; he whistled to attract its attention so that he could take a picture. After briefly trotting back and forth 10–15 m away, the wolf approached to within 3 m of Chapman. The biologist shouted at the wolf and banged on cooking pots, but the wolf retreated only 15 m and then returned. This time Chapman struck the wolf in the head with a boot that was lying nearby; the wolf retreated a short distance and returned; and again Chapman struck the wolf with the boot. The wolf responded by snapping at the boot and retreating about 10–15 m. When the wolf approached a third time, Chapman shot and killed it using a pistol. The wolf tested positive for rabies.

Chapman described the wolf's gait as, "slightly staggering." The wolf did not appear to be fully alert, and its muzzle was covered with saliva and debris. During the encounter the wolf had stopped on at least one occasion to bite into the ground. The previous day Chapman had witnessed this wolf fighting with several of its pack mates and a month later, in mid-August, Chapman found 6 dead wolves in the vicinity of his camp. Three of those wolves had porcupine quills imbedded in their muzzles. Two of the wolves were tested for rabies, both were positive. The persistent, but nonferocious behavior exhibited by this rabid wolf was similar to that described by Mark Williams for a wolf encounter in the Northwest Territories (Case 45).

Source: Chapman 1978.

CASE 47 — Anaktuvuk Pass, Alaska, 1945.

In winter 1944–1945, the elderly father of Elijah Kakinya was attacked by a wolf, presumed to be rabid, in a camp of the Nunamiut near Anaktuvuk Pass. The man was bitten on the hand and the animal was killed but not tested for rabies. Kakinya was not treated for rabies, but he did not develop the disease.

Further details of this attack were not available. The wolf was presumed to be rabid because the incident occurred during an epizootic of rabies in the Anaktuvuk area. At least 5 apparently rabid wolves were killed in that vicinity during 1945 (Rausch 1958).

Source: Letter from Dr Robert L Rausch to Don Ritter dated 17 Oct 2000; and Bob Stephenson, Alaska Department of Fish and Game, unpublished field notes.

CASE 48 — Etivluk River, Alaska, 1943.

Zacharias Hugo, a 14-year-old Eskimo boy, was hunting caribou during winter along the headwaters of the Etivluk River in northern Alaska. As he stalked along a willow-lined creek to intercept a herd of caribou, he came to a boulder-strewn hill and paused when he heard something crunching the snow behind him. He turned and saw a large black wolf approaching. The wolf jumped onto the boy's back and tried to bite into the boy's neck. Zacharias raised his arm to protect himself, and the wolf bit into his forearm. The boy was wearing a caribou skin parka and had his rifle attached to his backpack. With the wolf on him, Zacharias was unable to reach his rifle. He dropped face down into the snow as the wolf bit him along his legs, back and neck, and then dragged him about 15 m. The wolf paused briefly before biting again and dragging the boy another 3 m. Eventually, the wolf abandoned the attack and disappeared. Hugo attempted to follow the wolf but blowing snow obscured its tracks, and the boy returned to camp. Only 2 bites penetrated the boy's skin, but they inflicted 2 deep punctures in his right forearm that bled profusely.

The next day Zacharias and his father, Inualuruk, returned to the site and found where the wolf had spent considerable time among the rocks; they estimated several days based upon the amount of tracks and urination sites in the snow. The tracks were splayed open and Inauluruk believed the splayed tracks indicated the wolf was rabid.

This encounter has long been considered, and probably was, a rabid wolf attack (Don Ritter, Alaska Virology Laboratory, personal communication). It occurred during a period when a rabies epizootic spread throughout northern Alaska and into the western arctic of Canada. However, the wolf in this case was not killed, and the fact that the wolf abandoned the attack is somewhat inconsistent with other cases involving rabid wolves. In addition, Hugo was not treated for rabies but never developed the disease. The pattern of the attack, and Hugo's failure to contract rabies, leaves open the possibility that the wolf attacked the boy in a predation attempt on unfamiliar prey or misidentified the boy as a caribou because the boy was wearing caribou skin clothing.

Source: Interview with Zacharias Hugo recorded 24 October 1972 by Bob Stephenson, Alaska Department of Fish and Game.

CASE 49 — Wainwright, Alaska, 1943.

In May, 10-year-old Teddy Segevan was attacked by a rabid wolf as he was gathering ice for drinking water one morning before school. The boy was severely mauled and subsequently died from rabies. Similar to the case of Panuekuk Samson (Case 51), the wolf involved in this case mounted an aggressive attack that resulted in serious injury and transmission of the rabies virus

Source: Don Ritter, Alaska State Virology Laboratory, personal communication.

CASE 50 — Poulin, Ontario, 1942.

On 29 December, Mike Dusiac of the Canadian Pacific Railway was riding a small one-man rail cart in early morning darkness near Poulin, Ontario when a wolf suddenly lunged from the side of the track, grabbed the man's arm, and knocked both man and cart off the track. Once on the ground the wolf continued the attack, and the man held the wolf at bay with an axe for 25 minutes. On several occasions Dusiac struck the wolf with the ax but apparently did not severely injure the wolf. Finally, a passing train stopped when the crew saw the lone man fending off the wolf. Three crewmen from the train came to Dusiac's aid and killed the wolf with picks and other tools from the train. Dusiac was exhausted by the prolonged fight but was otherwise uninjured. The initial bite of the wolf, which knocked Dusiac off the track, had not penetrated his skin but instead had been caught in the man's sleeve. An experienced biologist that inspected the wolf carcass the next day reported the wolf was not an old wolf and appeared to be in normal condition.

Rutter and Pimlott (1968) reviewed the Dusiac attack several years later, and although the wolf was not tested for rabies, they concluded the wolf was rabid because of its persistence during the attack. Certainly, the persistent nature of the wolf's aggression was similar to that exhibited in some other cases involving rabid wolves (Cases 49 and 51).

Source: Peterson 1947.

CASE 51 — Noorvik, Alaska, 1942.

A 72-year-old Eskimo hunter, Panuekuk Samson, was severely mauled by a rabid wolf on 27 January. The attack occurred at night after the man heard a disturbance outside near his dog team. Samson went out to investigate and was ferociously and repeatedly attacked by the wolf over a 30-minute period during which the man was repeatedly bitten and the wolf repeatedly stabbed with a knife. During the encounter, the wolf periodically retreated a short distance away, then returned and attacked again. The victim was near exhaustion when the wolf finally retreated into the darkness and did not return. The man subsequently recovered from the mauling, but he developed rabies and died of the disease on 14 March 1942.

The wolf involved in this case was killed the following day while attacking dogs in the village of Kiana, 24 km from where it had attacked Panuekuk Samson.

Source: Don Ritter, Alaska State Virology Laboratory, personal communication and Rausch 1958.

NONAGGRESSIVE ENCOUNTERS

Investigative Search and Scavenging Behaviors

Investigative behaviors are well developed in wolves. When wolves are not conditioned to avoid humans, they may enter campgrounds, remote camping sites, or even villages to explore,

scavenge, and investigate those novel contexts. Where wolves find food they often become conditioned to seek out and search human-use areas for food, but even where wolves do not find food they sometimes chew on shoes, camping gear, sleeping bags, and human clothing. Often these wolves are described as nonaggressive, but their investigative behavior can sometimes lead to human injury. The following 19 cases (Cases 52–70) describe wolf investigative behaviors in human-use areas. In one case where a man was lightly bitten, the bite probably resulted as a consequence of the wolf's investigative behavior rather than as an agonistic response because the man was asleep when bitten, and when the man awakened, the wolf retreated.

CASE 52 — Denali National Park, Alaska, 2001.

In summer 2000 several wolves in the East Fork pack in Denali National Park, including the alpha female, became highly habituated to humans (Case 53). During winter there is little human activity in Denali Park and the East Fork pack has no access to human food or garbage. Natural prey consists of moose, caribou, and Dall sheep. However, the habituation fostered during summer 2000 persisted in those wolves and they began exhibiting similar behavior early in the tourist season of 2001. The following account illustrates a high level of habituation and an attraction to a crying infant.

Early in the evening on 31 May, a man walking his dog saw 6 wolves near the Teklanika campground. Later that night an infant began crying in a tent at one of the campsites. Three wolves entered the campground, approached the tent, and 1 wolf pressed its nose against the bug screen that was zipped closed. The parents of the child were inside the tent with the infant; they saw the wolf but made no noise or attempt to drive the wolf away. Eventually, the wolves began searching around the edge of the tent where they found a pair of sandals and a child's toy, which they chewed before moving off. The same wolves then moved to a nearby campsite where another small child was in a tent. The wolves investigated that tent, found another pair of shoes, and chewed those before leaving.

Source: Jason Ransom and Ed Vorisek, National Park Service, Denali Park, Alaska, unpublished occurrence reports and personal communication.

CASE 53 — Denali National Park, Alaska, 2000.

In summer 2000 a wolf pack denned near a campground in Denali Park and over the summer the wolves displayed increasingly habituated behavior toward people. The following series of encounters describe the development of food-conditioned and novelty-conditioned behaviors among the East Fork pack. Although the wolves learned the behaviors near the Teklanika campground, they subsequently exhibited food-conditioned behaviors within a 9-km radius of that campground on several occasions. One incident during July 2001, that probably involved wolves of the East Fork pack, occurred 30 km from the Teklanika campground. These incidents are similar to encounters reported from Canada's Banff National Park and Algonquin Provincial Park where wolves are also protected and frequently encounter people (Cases 54 and 58).

On 4 June at a campsite near Calico Creek, 4 people were sleeping when 2 wolves approached the campsite. "One wolf stayed just outside our campsite, and 1 wolf checked out our campsite, sniffing anything not natural (water bottles, socks, hiking poles, boots, etc.). They basically ignored us when we poked our heads out of our tents and talked. One wolf got a water bottle with a carry sleeve, bit off the toggle to pull the sleeve off, and then licked the sleeve (we

suspect it had dried Gatorade on it). After they got bored, they made a bee-line for the BRFCs (Bear Resistant Food Containers) and then left.”

On 9 June, 2 people were camping in open tundra at a backcountry site approximately 4 km from the nearest road. “At 9:30 my wife and I were talking inside the tent when we heard something sniffing around the tent. When we went out to investigate there was a wolf with our cooking utensils in its mouth. It did not bother about us being there. When it had eventually finished doing what it wanted, it left and continued in the same direction it had been going, toward another tent, maybe 2 or 3 km away.” The witnesses reported the cooking utensils included pots with burnt food residue.

On 30 June, 2 people were camping on a tundra bench above the junction of Calico Creek and the Teklanika River. During the night they left a backpack outside their tent. An animal dragged the pack 25–30 m and tore it open. It chewed on a can of bug spray and a water bottle, but no food was in the pack. The food was stored nearby inside BRFCs along with cooking pots, but the food and cooking gear were not disturbed. The people reported they heard nothing and slept through the encounter. Upon inspection of the bug spray can the next day, the campers found tooth marks that indicated the animal in question was probably a wolf.

On 7 July, 2 people were backcountry camping near the Teklanika River. They were inside their tent when a wolf approached to within 1 m. They reported the wolf did not react to their presence.

On 22 July, near the Teklanika River, a group of 5 wolves approach to within 6 m of a man at his backcountry campsite. The man reported the wolves were trying to get into his backpack that was lying near his tent. The wolves did not react to the man’s presence and eventually left the area when they noticed a small group of caribou in the distance.

On 26 July at the Igloo campground, witnesses saw a single wolf climb onto a picnic table to grab a water bottle, which it carried away. The wolf did not respond to attempts to discourage its behavior.

During the night of 26 July, wolves attacked and wounded a young bull moose near the Teklanika Bridge on the Denali Park Road. Periodically throughout the next 2 days, the wolves attempted to finish the kill, but the moose waded into deep water when the wolves approached. On 27 July, about 20 people had gathered on the bridge to watch the wolves. One of the wolves, a yearling, came onto the bridge and began approaching vehicles and people. The wolf attempted to grab an unattended backpack and successfully grabbed a photographer’s tripod. The wolf repeatedly circled to investigate people on both ends of the bridge and walked within 1 m of people showing little apparent concern. The wolf did not respond to shouts or loud noises but eventually wandered north along the river and stopped to investigate and eat what appeared to be a weathered piece of plastic. An adult female wolf also crossed the bridge and passed by people on the end of the bridge. Three other wolves that were involved in trying to kill the moose remained in the area but stayed well clear of people.

Source: Jason Ransom and Ed Vorisek, National Park Service, Denali Park, Alaska, unpublished occurrence reports and personal communication.

CASE 54 — Banff National Park, Alberta, 2000.

In summer 2000 a large pack of wolves (Fairholm pack) colonized the Bow Valley within Banff National Park near the town of Banff, Alberta. The valley contained a high concentration of wintering elk but also contained human residential areas and attracted thousands of tourists and campers during the summer months. Two wolves, 1 male and 1 female, began following

vehicles and then approaching parked vehicles, suggesting they were receiving food handouts from cars along the highway. The 2 wolves were captured and collared in early winter 2000; both were pups and were approximately 5 months old at that time of their capture.

In summer 2001 the collared wolves began entering the town, and the male killed a dog that was tethered to a porch in a residential neighborhood. The female took food from picnic tables, stole food from a U-Haul trailer, licked pots at campsites, stole a tablecloth from a storage bag, and foraged on campsite garbage, almost always at night. She also approached groups of people at campfires, and once, stuck her head into an open lean-to where 2 children were sleeping.

Park officials frequently monitored the radio signals as the wolves moved among residential areas. Witnesses described the wolves as nonaggressive, yet unafraid. In one instance, when chased on foot by park personnel, the female yearling ran just fast enough to stay 15–20 m ahead of her pursuer. The wolves were aversively conditioned with beanbags, rubber bullets, and noisemakers fired from shotguns when opportunities arose. The aversive conditioning had no lasting effect in repelling the wolves from human-use areas, but the wolves developed an avoidance response to the park wardens who were monitoring the wolves' movements.

Radiolocations indicated that the problem wolves continued to interact with other pack members, and the female periodically returned to the 2001 rendezvous site and served as a "babysitter" for that season's litter of pups. Observations of behavioral interactions with other pack members showed that the male, despite his size of 54 kg, occupied a low rank in the pack and several times was the victim of mobbing behavior by other pack members. The pack numbered 17 wolves in summer 2001, but the collared yearlings often traveled together, separated from the remainder of the pack. Other pack members occasionally exhibited fearless behavior, and noncollared wolves were occasionally seen with the collared wolves in human-use areas. The 2 habituated wolves continued to prey on elk and other natural prey with other wolves of their pack.

Park personnel became concerned that the food-conditioned and habituated behaviors of the 2 yearlings was leading to a generalized food-conditioned response among other members of the pack, and that their habituated behavior could lead to human injury. Therefore, wardens destroyed the 2 wolves; the male was killed in late July and the female in late August 2001.

The wardens maintained an almost constant vigil for these wolves beginning in early July 2001. Many contacts with the wolves were made during the night or early morning hours before dawn. The female was fired upon with aversive conditioning materials on 7 occasions and hit with rubber bullets or beanbags at least 3 times. The male was hit with a rubber bullet at least once.

Source: Glen Peers, Banff National Park, Alberta, unpublished occurrence reports and personal communication.

CASE 55 — Shrimp Bay, Revillagigedo Island, Alaska, 2000.

On 15 May Alaska Fish and Wildlife Protection Officer Dennis Roe received an anonymous telephone call reporting a fearless wolf had been shot near a logging camp on Revillagigedo Island, Alaska. Roe investigated the report and found that truck drivers and equipment operators frequently fed a wolf near the remote logging site. Workers at the camp reported that the wolf quickly became food conditioned and began approaching people, stealing food from backpacks and vehicles. A photograph discovered by Roe showed the wolf taking food from a worker's hand.

The workers described the wolf as persistent rather than aggressive. That persistence annoyed and angered the cutters who were required to work on the ground where the wolf would constantly be searching for a handout. One worker had to start his chain saw and drive the wolf away by holding the blade at the wolf's face. Finally, frustrated by the wolf's persistence, a worker attempted to shoot the wolf, but the bullet passed through the wolf's ear causing a superficial wound.

The persistent approach behavior demonstrated by this wolf was similar to that described in other cases where wolves received food handouts (Cases 1 and 5). Food-conditioned approach behavior can lead to agonistic aggression if the wolf is denied an expected food handout (Cases 10, 11, and 12)

Source: Dennis Roe, Alaska Department of Public Safety, personal communication.

CASE 56 — Algonquin Provincial Park, Ontario, 2000.

Just before dark on 16 September, 2 park visitors encountered a wolf on a trail at a distance of about 15 m. The wolf started toward them, and one of the people shouted and began waving a walking stick. The animal approached until just beyond the reach of the stick and then stood its ground. The wolf did not growl but for several minutes the people held it at bay with the walking stick. The wolf retreated into the trees after one of the people threw a piece of wood that came close to striking the wolf.

Source: Dan Strickland, Algonquin Provincial Park, Ontario, personal communication.

CASE 57 — Fort Knox Gold Mine, Fairbanks, Alaska, 1999.

Wolves had been seen in the vicinity of the Fort Knox Gold Mine for several years, but none exhibited fearless behavior until summer 1999. During that summer wolves denned near the mine, and in midsummer, they established a rendezvous site below the mine tailings dam near a road occasionally used by mine employees and state biologists that monitored water quality. Throughout July and August the adult wolves foraged in the surrounding forests and returned to the rendezvous site where the 5 gray pups were viewed and photographed by mine employees. The wolves progressively became habituated and traveled near drilling pads where workers were operating loud machinery.

The wolves never approached people, but in late August a wolf approached a pickup truck, suggesting that mine employees may have thrown food scraps from vehicles. To avoid the potential for an aggressive encounter or food conditioning, the mine's environmental officer hazed the wolf pack away from the mine using cracker shells.

Unlike the wolves in Banff National Park that were not deterred by aversive conditioning (Case 54), the wolves at the Fort Knox mine immediately began avoiding people after aversive conditioning. The difference may be related to the stage of food-conditioned behavior. At Banff it was well developed before aversive conditioning began, but at the Fort Knox mine aversive conditioning was applied at the first appearance of approach behavior. Alternatively, the effectiveness of aversive conditioning at Fort Knox may have been related to the confined nature of the mine site where any food would have been obtained from only 1 area. Conversely, at Banff the wolves potentially obtained food from several widely separated locations, not all of which were associated with aversive conditioning.

Source: Bill Jeffers, Fort Knox Gold Mine, Fairbanks, Alaska, personal communication.

CASE 58 — Algonquin Provincial Park, Ontario, 1994.

On 22 August a woman and 2 teenage girls camped on Burnt Island in Algonquin Park. After dark they heard something outside their tent. The woman looked out and, in the moonlight, saw a wolf pulling a pack away from the tent. The woman quietly withdrew back into the tent. The wolf crushed a mascara box inside the pack and then dropped the pack about 2 m from the tent before moving off. The woman later reported she thought the wolf was frightened when it sensed her presence.

During August and September of that year a wolf displayed similar camp robbing behavior in the Opeongo-Lavieille Lake area and bit 2 people (Case 6). However, the distance between Burnt Island and Opeongo-Lavieille lakes suggested that 2 separate wolves were involved.

Source: Dan Strickland, Algonquin Provincial Park, Ontario, personal communication.

CASE 59 — Tibbles Lake, British Columbia, 1988.

On 23 July a man sleeping in the open behind a summer home at Tibbles Lake was awakened at 5:00 AM by a sudden sharp pain in his side, and he saw a wolf staring at him, less than 1 m away. The wolf moved off about 5 m when the man shouted and waved his hands, but then it turned and approached again. The man rose up on his knees while shouting and waving his arms. The wolf walked away, stopping to look back before it disappeared from sight. The wolf had bitten into the sleeping bag, grasping the sleeping man between his hip and armpit. The bite caused a minor abrasion and left 2 bruises on the man's side, but the fabric on the sleeping bag was not punctured or torn. The investigator characterized the bite as, "more of a hard pinch rather than an actual bite."

At 5:30 AM the following morning the wolf raided a nearby farmyard killing 3 sheep, fatally mauling 3 sheep, and inflicting bite wounds on 7 other sheep. At the sound of the disturbance, the livestock owner emerged from his house and saw the wolf carrying a chicken in its mouth approximately 10 m away. The man killed the wolf with a rifle. Later, the bite victim testified that he believed the dead wolf was the same wolf that had bitten him the previous night. The wolf, a 36 kg male, was in good condition and tested negative for rabies.

This case is unusual because the first reported encounter with this wolf involved the unprovoked bite of the man at Tibbles Lake. In other biting incidents, the wolves commonly exhibited food-conditioned or habituated behavior for some time before approaching people. I did not classify this encounter as aggressive because it seemed possible that the wolf's intent was to bite into the bag, rather than the man. However, 3 other cases also describe wolves that bit into or pulled on sleeping bags when campers were sleeping in the open (Cases 1, 4, and 61). In 2 of those cases serious injury resulted when the incidents escalated from a pull on a sleeping bag to an attack on the victims' heads (Cases 1 and 4).

Source: Al Lay, British Columbia Ministry of Water, Land and Air Protection, Princeton, British Columbia, unpublished occurrence report and personal communication.

CASE 60 — Riding Mountain National Park, Manitoba, 1984.

In May 1984 Dr Paul Paquet was recording wolf behavioral activities at a den site in Riding Mountain National Park, Manitoba. The alpha female was highly tolerant of his presence and allowed him to observe from a distance of only 40 m; sometimes she approached him to within a few meters. On 31 May, Paquet was lying in a bivouac sack making observations when the wolf approached and snatched a small lens cloth that was lying on the ground nearby. She carried the

cloth back toward the den and afterward, showed considerable interest in carrying it as she walked about the area. The following year, Paquet was observing the same den site of the same female and was surprised to see her carrying the lens cloth that she had taken the year before. Evidently, she had cached the cloth near the den site and continued to find it an interesting novelty a year after first borrowing it from Paquet. The wolf was not food-conditioned, and the chemical treatment on the cloth may or may not have been related to the wolf's interest in it.

This case illustrates a wolf's interest in a non-food "novelty." Habituated wolves in Denali, Banff, and Algonquin Parks also demonstrated that behavior (Cases 4, 53, and 54). Similar behavior was also noted among apparently nonhabituated wolves that encountered travelers in remote settings in the 1800s (Young 1944).

Source: Dr Paul Paquet, University of Calgary, Calgary, Alberta, personal communication.

CASE 61 — Mount Robson Provincial Park, British Columbia, 1981.

In midsummer 1981 a wolf near the Yellowhead campground in Mount Robson Provincial Park was thought to be responsible for the disappearance of a dog belonging to a tourist. A few days after the dog disappeared, 2 people were sleeping in the open in a nearby campsite. In the night a lone wolf bit into one of the sleeping bags and dragged the bag and its occupant across the ground. The startled camper yelled and frightened the wolf away. The man was not injured.

The following night Conservation Officer Murray Vatamaniuck placed a bag of garbage in the campground as bait and sat nearby in the front seat of his truck with the door open. A wolf entered the campground, approached to within 20 m of Vatamaniuck while staring directly at him, and then circled toward the back of the vehicle. Officer Vatamaniuck emerged from the truck, stalked toward the wolf, and killed it with a shotgun. The wolf was old, and its teeth badly worn. Other than the incident of the missing dog, there had been no other reports of wolves near the campground. Based on the wolf's behavior, Officer Vatamaniuck suspected the wolf had previously scavenged garbage from the campground, probably at night.

Source: Murray Vatamaniuck, British Columbia Ministry of Water, Land and Air Protection, Vernon, British Columbia, personal communication.

CASE 62 — Stony Rapids, Saskatchewan, 1980.

In winter 1980–1981 at least 4 wolves began feeding from an open garbage dump near the village of Stony Rapids on the Fond de Lac River in northern Saskatchewan. The wolves became habituated to the garbage trucks and began to time their arrival at the dump with the arrival of the garbage trucks. The wolves would then begin to scavenge in the garbage near the truck drivers. Eventually, the wolves moved into town and began killing dogs. Government agents began a trapping effort that removed most of the offending wolves and the problems ceased. Residents of the village did not actively hunt or trap wolves.

Source: Ed Kowal, Saskatchewan Environment and Resource Management, Prince Albert, Saskatchewan, personal communication.

Investigative Behavior Near Towns and Villages. When people encounter fearless wolves near rural villages, the wolves' lack of wariness is often interpreted as being associated with disease. As a result, many wolves have been killed in and around Alaskan villages and submitted for rabies testing.

The following 8 brief descriptions were taken from the files of the Alaska Virology Laboratory. All of the wolves involved in these encounters tested negative for rabies, and none were known to be previously food conditioned or habituated to people. Instead, these wolves probably showed little fear of people simply because they were unfamiliar with people and were not conditioned to avoid people. Such encounters are common throughout remote areas of Alaska and Canada where human densities are low and wolves occupy relatively pristine habitats.

CASES 63–70 — Various Alaskan villages, 1971–2000.

Case 63: In February 1973 a wolf entered the town of Palmer and demonstrated little fear of people. There was no known human contact, but the wolf was shot and submitted for rabies testing.

Case 64: In 1974 a wolf appeared near the village of Bethel and was approached several times by people. The wolf showed no fear and was killed the following day.

Case 65: In 1976 a hunter encountered a wolf near Pilot Point, Alaska. The wolf did not show normal signs of fear and was killed by the hunter.

Case 66: In 1978 a wolf was scratching at a tent near Cold Bay, Alaska and would not be scared away. The animal was destroyed and skinned.

Case 67: In 1985 a wolf entered Arctic Village, Alaska. The wolf was unafraid and refused to leave the area. It was killed and submitted for rabies testing.

Case 68: In 1992 a wolf was seen wandering around the airport at King Salmon, Alaska. The airport manager shot it after he was unable to harass the wolf away from the airport.

Case 69: In 1994 a wolf peered into the window of a house in Dillingham, Alaska. The wolf seemed fearful, but curious. It did not flee before being killed.

Case 70: In 2000 a wolf walked up to a house in Chandalar, Alaska. It was reported to be unafraid and was killed by a local resident.

Source: Alaska State Virology Laboratory, unpublished files 1971–2000.

Investigative Approach Behavior

In most cases where nonhabituated wolves approached people in remote settings the wolves quickly retreated once they realized they were approaching humans. Often the people involved are not moving, and are bent over, sitting, or partially concealed. Other approach behaviors described below involved wolves that were habituated. In those cases wolves sometimes approached and then followed or paced alongside people that were walking (Cases 73 and 76).

CASE 71 — Denali National Park, Alaska, 2001.

On 5 July a motorist on the Denali Park Road saw a wolf standing in the road ahead of him. He stopped his vehicle and watched as the wolf howled and 2 other wolves joined it on the road. A man riding a bicycle then approached from behind the parked vehicle and stopped about 100 m from the wolves. One of the wolves walked toward the cyclist and sat down next to him, staring up at the man. A second wolf did the same, and the man put his bicycle between himself and the wolves. The third wolf then approached, continued past the man and into the brush alongside the road; the other 2 wolves eventually followed.

This incident occurred near a campground where wolves had previously approached tents. It was unknown whether the wolves involved in this incident were food conditioned, but they certainly displayed a high level of habituation. The approach and wait behavior seen in this case

is similar to cases of escort behavior (Cases 73 and 76) and lacked the aggressiveness displayed by wolves that were conditioned to receive frequent food handouts (Cases 1, 5, 10, 11 and 12).

Source: Jason Ransom and Ed Vorisek, National Park Service, Denali Park, Alaska, unpublished occurrence reports and personal communication.

CASE 72 — Denali National Park, Alaska, 2000.

A series of encounters in Denali Park during summer 2000 illustrate investigative approach behavior by wolves in different parts of the park, suggesting at least 2 different groups of wolves were involved in these encounters.

On 5 June 2000, 2 people were hiking along the Sanctuary River when they noticed a group of 6 or 7 caribou approximately 1 km from the river. They saw 1 caribou running with a large predator chasing it. Initially, they thought it was a bear but then realized it was a wolf. The wolf stopped chasing the caribou and began running toward the people at full speed. The wolf ran within 100 m, slowed to a walk, and approached the people. The people yelled and waved their hands. The wolf stopped, turned to the side, and then continued its approach. Despite the yelling and hand waving, the wolf approached to within about 10 m and then circled the people before continuing along the river.

On 17 June near Glacier Creek, 5 people on a day hike were lying down and resting when a gray wolf approached. The people noticed 2 other wolves ‘creeping’ up to them from the side. The people stood up when the wolves were less than 10 m away and the wolves retreated.

On 28 June near the Toklat River at the base of Divide Mountain, a number of backcountry campers were finishing their meal when they saw a wolf in the distance. The wolf noticed the people and changed direction toward them. It came within 50 m and was "wary" as it passed. After the wolf passed, a second, smaller brown wolf appeared behind the campers at a distance of only 5 m. The second wolf was reportedly "not aggressive, only inquisitive." The people yelled and threw rocks at this second wolf; it ran about 25 m before stopping to look back, and then it left the area.

Source: Jason Ransom and Ed Vorisek, National Park Service, Denali Park Alaska, unpublished occurrence reports and personal communication.

CASE 73 — Denali National Park, Alaska, 2000.

On 27 May a person was walking on a gravel bar near the Teklanika campground when a wolf approached to within 3 m. The witness described the encounter as follows: “I stopped and we checked each other out. I walked and he walked. I did this several times and he stayed right with me at about 5 feet. People came out and he trotted off toward my brother – did the same with him. Very docile, very curious, not aggressive at all. He just went off into the woods. Wow!”

Source: Jason Ransom and Ed Vorisek, National Park Service, Denali Park Alaska, unpublished occurrence reports and personal communication.

CASE 74 — Gravina Island, Alaska, 2000.

On 4 July, University of Alaska students Kris Larsen and Colleen Ianuzzi were walking across an open tide flat when they saw 7 wolves trotting toward them from a distance of about 400 m. The wolves picked up their pace at 100 m and ran across a small creek directly at the students. When the wolves were at approximately 30 m, one wolf abruptly stopped. The

remainder of the pack continued for a few more paces. For 20–30 seconds the wolves paced and shifted back and forth, some of them whimpering, all of them staring at Larsen and Ianuzzi. Eventually, the wolf that had stopped first, turned and trotted away; the remainder of the pack followed. Larsen and Ianuzzi watched for the next 20–30 minutes as the wolves searched along the edge of the tide flat. When the pack came to a spot where Larsen had seen several deer earlier in the day, the wolves suddenly darted into the trees and were lost from view.

This encounter is similar to one reported in Denali Park during June 2000 (Case 72). In both cases, the wolves appeared to be hunting when they detected, and then purposefully approached, people. In both cases the wolves stopped at close range, and in both cases the wolves lived in areas where they would commonly encounter people. It is impossible to know if the wolves approached what they thought were people or approached after mistakenly identifying the people as potential prey. In either case, these encounters illustrate investigative behavior of wolves that could be interpreted as aggressive by witnesses unfamiliar with this behavioral pattern.

Source: Kris Larsen, University of Alaska, Fairbanks, personal communication.

CASE 75 — 50 km north of Tasiujaq, Quebec, 1999.

In late August 1999 professional photographer Heiko Wittenborn was photographing caribou in a remote area of northern Quebec, 50 km north of the village of Tasiujaq. He was watching a bull caribou move toward him from a distance of about 500 m when the caribou briefly disappeared from sight behind intervening terrain and then suddenly appeared again being chased by 2 wolves. The wolves quickly gave up the pursuit and disappeared from Wittenborn's view. A few minutes later, Wittenborn saw 6 wolves near the shore of a nearby lake moving toward him from about 150 m. The man backtracked to put himself into a position on the wolves' line of travel, and he set his tripod on a well-worn caribou trail. When 2 of the wolves encountered the trail they turned uphill toward Wittenborn, the other 4 wolves moved out of view. The 2 wolves sniffed the ground as they trotted up the trail but appeared not to detect the man's presence until they were within 50 m. The lead wolf then looked directly at Wittenborn as it trotted toward him. When the wolf was about 20 m away, it adopted a slightly crouched posture but slowly continued walking and staring directly at the photographer who was standing quietly behind his tripod. When the wolf reached a distance of 3 m Wittenborn growled, "like the growl of a dog." The wolf appeared startled; it took a step backward and then began circling. The second wolf had lagged some distance behind and it also began a wide circle. The wolves maintained eye contact with Wittenborn as they circled at a distance of about 15 m. Then without looking back, the wolves trotted across the tundra and out of sight.

This approach behavior is similar to that described in other cases where apparently naïve wolves first encounter people at close range in remote settings. However, Wittenborn reported that at 3 m the wolf was still focused directly on his face and moving toward him. He felt that if he had not growled, thereby surprising the wolf, the wolf would have continued those last few steps.

Source: Heiko Wittenborn, Montreal, Quebec, personal communication.

CASE 76 — Pacific Rim National Park, Vancouver Island, British Columbia, 1999.

The same wolves were probably involved in both of the following encounters and park officials suspected these wolves sometimes foraged at nearby landfills. A pack of 9 wolves was

seen in the area on 1 March, but only 2–4 wolves were involved in each of the encounters described below.

In the late afternoon of 3 February, a woman was walking on a beach when 4 wolves approached and surrounded her at a distance of 3 m. The woman turned and began walking back along the beach toward the nearby Wickaninnish Visitor Center. The wolves walked beside her, keeping pace and occasionally approaching within 1 m. After a few minutes the wolves turned and traveled down the beach away from the woman, but then the wolves returned and followed beside her again for a short distance. Eventually the wolves lost interest, fell back, and disappeared from view.

The following morning a man and a woman were returning along a trail through the forest from a nearby beach when they saw 3 wolves traveling parallel to them in the brush only 3 m away. They reported the wolves were moving silently in a crouched position. By the time the couple reached the parking lot the wolves had disappeared from view.

During both of these encounters, the people did not attempt to scare the wolves with shouts or other threatening gestures. The wolves did not vocalize or act aggressively, and the people felt nervous but not threatened.

Source: Bob Hansen, Pacific Rim National Park Reserve, British Columbia, unpublished Warden Service occurrence reports.

CASE 77 — Great Falls, Manitoba, 1991.

In early January 1991 Stuart Jansson of Great Fall, Manitoba was checking his trapline about 100 miles northeast of Winnipeg. It was a clear night, the moon was full and the ground was snow covered. The temperature was -38°F . Jansson parked his truck on a remote road and when he emerged from the vehicle he heard wolves howling nearby to the north. His traps were set south of the road, and he walked off the road about 1 km to check his traps. Finding nothing in his traps Jansson returned toward his vehicle, but when he was approximately 300 m from his truck, he saw a wolf crossing his trail only 30 m behind and then saw 2 wolves, one on either side, also at a distance of about 30 m. For the next several minutes as Jansson walked, the wolves kept pace alongside him. When he approached his vehicle, 2 more wolves were waiting on the road and a third was standing on a hill a short distance away. The wolves retreated back into the brush when Jansson stepped onto the road. He believed the wolves had followed him because they had mistaken him for potential prey when they first heard him in thick brush. He was not carrying any lure or bait that would have attracted the wolves. Wolves in the area were hunted and trapped and commonly encountered people, so it is unlikely their behavior could be attributed to inexperience, unless the animals were pups of the year.

Source: Stuart Jansson, Great Falls, Manitoba, personal communication.

CASE 78 — Ungava Peninsula, Quebec, 1982.

In February 1982 Stuart Luttich and Maria Berger landed near a caribou carcass that was lying on the Larch River southwest of Kuujuaq, Quebec. Luttich remained near the running helicopter to examine the carcass and Berger walked upstream about 200 m to collect samples from leg bones that the wolves had scattered on the river. As Berger bent to examine a bone she saw a wolf emerge from the brush along the shoreline and then a second wolf emerged on the opposite shore. Both wolves trotted toward her and she shouted when they were still some distance away but they continued toward her. Luttich described the first wolf as approaching

Berger in a crouched stalking posture. When the wolf was 20–30 m away, Berger shouted again and waved a leg bone in the air. The wolf stopped, stood upright, and took a quick look at Berger before retreating back into the brush. Luttich reported he had seen 3 other wolves in the brush along the river shoreline only 30–40 m away, and they watched the biologists for several minutes before disappearing from view. Both Berger and Luttich described the wolves as curious and felt that because the sighting was in a remote location it was possible the wolves had not previously encountered people. Luttich and Berger had a similar experience the next year in a different area of Quebec (Case 79).

Source: Stuart Luttich (retired), Wildlife Research Division, Department of Tourism, Culture, and Recreation, Goose Bay, Newfoundland; and Maria Berger, Fairbanks Alaska, personal communication.

CASE 79 — Clearwater Lakes, Quebec, 1983.

Stuart Luttich and technician Maria Berger were investigating causes of caribou mortality near Clearwater Lakes in northern Quebec in February 1983. Their helicopter overflew a lone wolf feeding on a caribou carcass and landed at another caribou carcass within 200–300 m. The helicopter did not appear to frighten the wolf and the wolf continued to feed.

After Luttich and his crew had examined the dead caribou they returned to the helicopter and then saw the wolf trotting toward them with its head up and tail out. The wolf continued to approach in what Luttich described as a nonthreatening manner until within 5–10 m from the field crew of 4 people. The helicopter was running, but the noise of the engine and movement of the rotors did not appear to deter the wolf's advance. The wolf suddenly stopped and sniffed the air. It turned back, rather hesitantly, toward the caribou carcass, peering over its shoulder to watch the people as it retreated.

Source: Stuart Luttich (retired), Wildlife Research Division, Department of Tourism, Culture, and Recreation, Goose Bay, Newfoundland; and Maria Berger, Fairbanks, Alaska, personal communication.

CASE 80 — Northern Saskatchewan, 1983.

In March, biologists Frank Miller, Anne Gunn, and Tim Trottier conducted caribou composition counts in northern Saskatchewan. After their helicopter landed near a group of caribou, the workers set up a spotting scope to observe the caribou. Trottier walked away from the other 2 biologists in an attempt to circle the caribou group, hoping the animals would drift closer to the spotters. When he was about 300 m from Miller and Gunn, Trottier sat down on a snow-covered hummock. He soon noticed a single approaching wolf, and as the wolf came closer it lowered its head, began a circular approach, and maintained eye contact with Trottier. When the wolf was within 10 m, Trottier stood up. Immediately the wolf stopped and then retreated. Trottier later discovered that he was sitting on a wolf-killed caribou that had been drifted over by snow.

Source: Tim Trottier, Saskatchewan Environment and Resource Management, La Ronge, Saskatchewan, personal communication.

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Photo by Jason Ransom



Figure 1 Geographic distribution of 80 wolf–human encounters described in the case history. Clusters of encounters in central Alaska, southeastern Ontario, southwestern Manitoba, and on Vancouver Island are associated with National or Provincial Parks. The higher density of encounters in northern Alaska resulted from a combination of wolf research activities, the trans-Alaska pipeline, rabies, and nonaggressive encounters near remote villages.

APPENDIX People who contributed information or references for the case history

Name	Contributors occupation or role in case history investigation	Location
Adams, Layne	Wildlife Biologist	Alaska
Arsenault, Al	Wildlife Biologist	Saskatchewan
Austin, Matt	Wildlife Biologist	British Columbia
Baer, Al	Wildlife Biologist	Yukon
Bekker, Jur	Area Supervisor	British Columbia
Berger, Maria	Wildlife Biologist	Alaska
Blake, Douglas	Conservation Officer	Labrador
Bradford, Wes	Wildlife Biologist	Alberta
Cloward, Marc	State Trooper	Alaska
Darimont, Chris	Wildlife Biologist	British Columbia
De Almeida, Maria	Wildlife Biologist	Ontario
Doidge, Bill	Wildlife Biologist	Quebec
Doidge, Eric	Conservation Officer	Nunavut
Flath, Randy	Wildlife Biologist	Alberta
Gardner, Craig	Wildlife Biologist	Alaska
Greenblatt, Andy	Hunting Guide/Pilot	Alaska
Hansen, Bob	Park Warden	British Columbia
Hayes, Bob	Wildlife Biologist	Yukon
Jansson, Stuart	Trapper	Manitoba
Jeffers, Bill	Environmental Officer	Alaska
Kowal, Ed	Wildlife Biologist	Saskatchewan
Larsen, Kris	Student	Alaska
Lawrence, Roy	Witness	Alaska
Lay, Al	Conservation Officer	British Columbia
Luttich, Stuart	Wildlife Biologist	Labrador
MacInnes, Charlie	Wildlife Biologist	Ontario
McAllister, Karen	Wildlife Biologist	British Columbia
McKay, Andy	Conservation Officer	British Columbia
McKay, Ian	Wildlife Biologist	Manitoba
Mooney, Phil	Habitat Biologist	Alaska
Mulders, Robert	Wildlife Biologist	NWT
Mullin, Tabitha	Conservation Officer	Nunavut
Nordberg, Samantha	Witness	Alaska
Otto, Robert	Wildlife Biologist	Labrador
Paquet, Paul	Wildlife Biologist	Saskatchewan
Peers, Glenn	Park Warden	Alberta, Banff
Person, David	Wildlife Biologist	Alaska
Piorkowski, Bob	Fisheries Biologist	Alaska
Porter, Boyd	Wildlife Biologist	Alaska
Ransom, Jason	Wildlife Technician	Alaska
Ritter, Don	Microbiologist	Alaska
Roe, Dennis	Conservation Officer	Alaska
Rosatte, Rick	Wildlife Biologist	Ontario

Name	Contributors occupation or role in case history investigation	Location
Schafer, James	Wildlife Biologist	Labrador
Schwantje, Helen	Veterinarian	British Columbia
Simpson, Carol	Witness	Alaska
Stenglein, Diane	Witness	Alaska
Stephenson, Bob	Wildlife Biologist	Alaska
Strickland, Dan	Park Naturalist	Ontario
Stronks, Rick	Park Naturalist	Ontario
Sundquist, Lance	Regional Enforcement Manager	British Columbia
Szepanski, Michelle	Wildlife Biologist	Alaska
Thompson, Teresa	Witness	Alaska
Treichel, Bruce	Wildlife Biologist	Alberta
Trottier, Tim	Wildlife Biologist	Saskatchewan
Valkenburg, Pat	Wildlife Biologist	Alaska
Vatamaniuck, Murray	Conservation Officer	British Columbia
Vorisek, Ed	Wildlife Technician	Alaska
Williams, Mark	Wildlife Biologist	British Columbia
Windh, Jacqueline	Photographer	British Columbia
Wittenborn, Heiko	Photographer	Quebec
Wright, Al	Pilot	Alaska

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