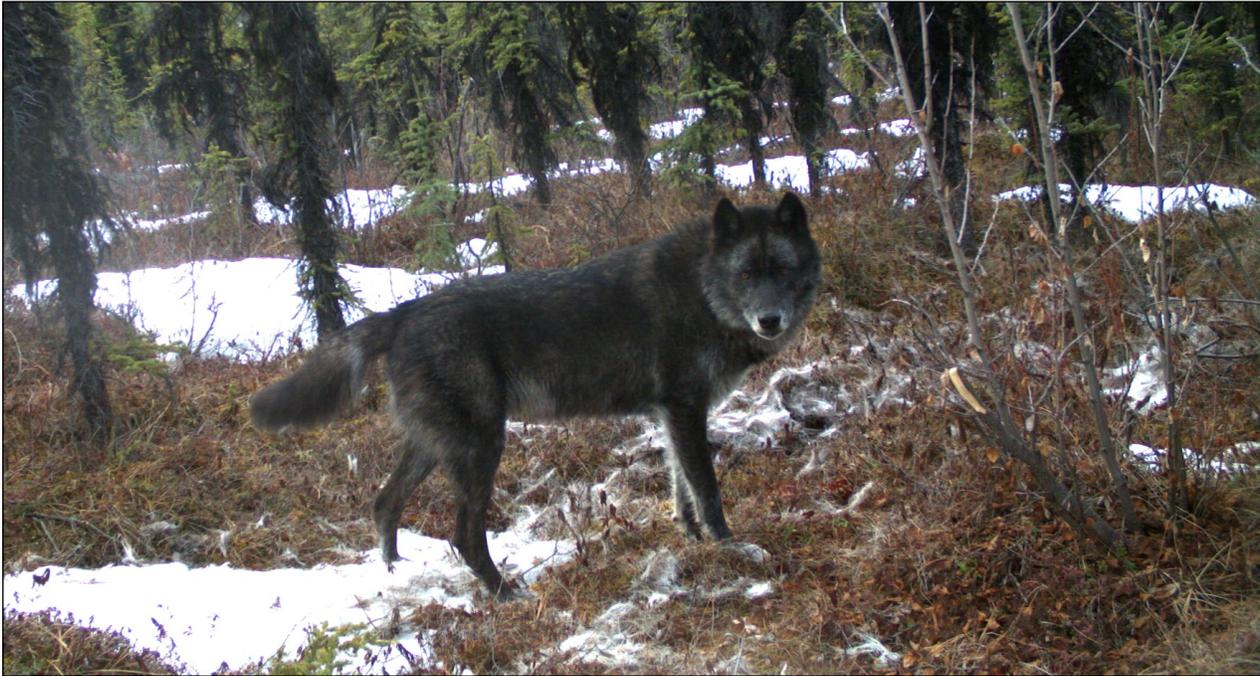




2021 Annual Wolf Report



On the cover, clockwise from top: A wolf pauses at an old carcass site (*NPS photo*); a wolf passes between two spruces (*NPS photo*); a wolf shedding its winter coat pauses in front of a trail camera (*NPS photo*).

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A wolf with a caribou leg. *NPS Photo*



Wolves investigate an old carcass. *NPS Photo*

Background

Wolves are one of six keystone large mammal species in interior Alaska, along with grizzly bears, black bears, moose, caribou, and Dall sheep. Wolves are important to people and to the ecosystem as a whole. As a top predator, wolves may play a key role in influencing ungulate populations, such as caribou. This may also influence vegetation patterns and promote species diversity .

Wolves are found in all three parks of the Central Alaska Monitoring Network (CAKN): Denali National Park and Preserve (Denali), Yukon-Charley Rivers National Preserve, and Wrangell-St. Elias National Park and Preserve. Indeed, wolves are specifically identified in the enabling legislation and management objectives of all three CAKN parks.

This report summarizes efforts to monitor wolves in Denali National Park and Preserve through December 2020. The main goal of monitoring is to track how many wolves there are and where they're moving. However, a variety of additional data is obtained in the monitoring process. This information can help future wildlife management and research, and can also help develop scientific models of predator/prey systems.

For example, scientists use data obtained from wolf monitoring to help protect wolf dens as part of the Denali Wolf-Human Conflict Management Plan. In heavily visited portions of the park, managers want to know where active wolf dens and rendezvous sites (pup rearing areas) are so that they can be protected from disturbance.

Additionally, data on the genetic, physical, and immunological characteristics of wolves, obtained in the course of wolf capture, will be important in evaluating long-term changes in wolf populations in Alaska.

Information gathered through wolf monitoring can also help scientists determine whether the park packs are being impacted by activities happening outside of the parks, such as intensive wolf harvest or wolf control.



Wolf tracks. *NPS Photo*

Wolves are important to people in Alaska. Some value the opportunity to hunt or trap wolves while others value their existence or the opportunity to see a wolf. Wolves are of great significance to Denali's visitors because of the exceptional opportunities to view wolves in Denali. The unique long-tenured research project in Denali allows scientists around the world to understand how wolves live in a relatively intact ecosystem, and will be invaluable for years to come.

Park-wide monitoring of wolves in Denali was initiated by Resource Management Ranger John Dalle-Molle in 1986, with principal investigators L. David Mech and Layne Adams. Field work and project management from 1986 to 2016 was conducted by Dr. Layne Adams, Dr. Steve Arthur, Dr. Bridget Borg, John Burch, and Tom Meier. In 2021, Dr. Bridget Borg oversaw the program, and field work and program support was conducted by biological technician Kaija Klauer.

Wolf Project Goals

Wolf research and monitoring in Denali occurs annually to meet the following measurable objectives:

- Capture and radio-collar 1-3 individuals in each wolf pack identified in the study area.
- Determine the demography (numbers, colors, age structure) of monitored wolf packs.
- Obtain genetic samples from captured wolves.
- Determine pack size for each collared pack in fall (early winter) and spring (late winter).
- Detect pack extinction and pack formation events in the population.
- Locate non-radio-collared wolf packs on Park and Preserve lands using aerial snow tracking.
- Detect changes in wolf density, pack size, and home range size over time.
- Monitor and detect changes in the physical, immunological, and genetic makeup of the wolf population over time.
- Investigate the effects of wildlife management activities on the natural and healthy character of wolves in Denali.
- Investigate the biological and social characteristics of wolf viewing by visitors in Denali, and factors that may affect wolf viewing opportunities.



National Park Service



Central Alaska Inventory & Monitoring Network

The 2009 wolf monitoring protocol, one of the first protocols approved for the Central Alaska Network's Inventory and Monitoring Program, identifies the long term monitoring objectives for Denali's Wolf Project . It also lays out procedures that parks use to collect the data.

National Park Service
U.S. Department of the Interior



Natural Resource Program Center

Wolf Monitoring Protocol for Denali National Park and Preserve, Yukon-Charley Rivers National Preserve and Wrangell-St. Elias National Park and Preserve

August 2009
Natural Resource Report NPS/CAKN/NRR—2009/168



2021 Summary



In 2021, 14 wolf packs were monitored in the Denali study area and 29 aerial tracking flights were conducted to observe wolf pack locations, obtain pack counts, locate den sites and provide estimates of pups produced. Information from these flights also documented wolves feeding at kills 37 times, comprised of 4 caribou, 28 moose, 1 Dall sheep and 4 kills of indeterminate species.

In 2021, staff captured and collared 22 wolves during two capture efforts, including 7 recaptures of wolves collared in previous years to replace aging or failed collars. Wolves were monitored to estimate survival, pack size, den locations, and denning success. In spring 2021, 93 wolves in 14 packs were counted in the study area, for an estimated population of 98 wolves. There was evidence that 10 packs denned in the park in 2021, and together they recruited an estimated total 35 pups to the population. Nine collared resident wolves died in 2021: 5 were legally harvested, and 4 were killed by other wolves. In November, 1 new pack (Hana) was located and collared in the eastern area of the park. In fall 2021, 121 wolves were counted in 12 packs, for an estimated population of 128 wolves. See territory map (page 9) for Spring 2022 estimates.

Due to Covid-19 changing the nature of park visitation, bus traffic, and wildlife sighting data collection protocols, an index of wolf viewing was not calculated in 2021.

In addition to addressing our long-term monitoring goals, the Denali Wolf Project worked with regional, national, and international collaborators on several research projects.

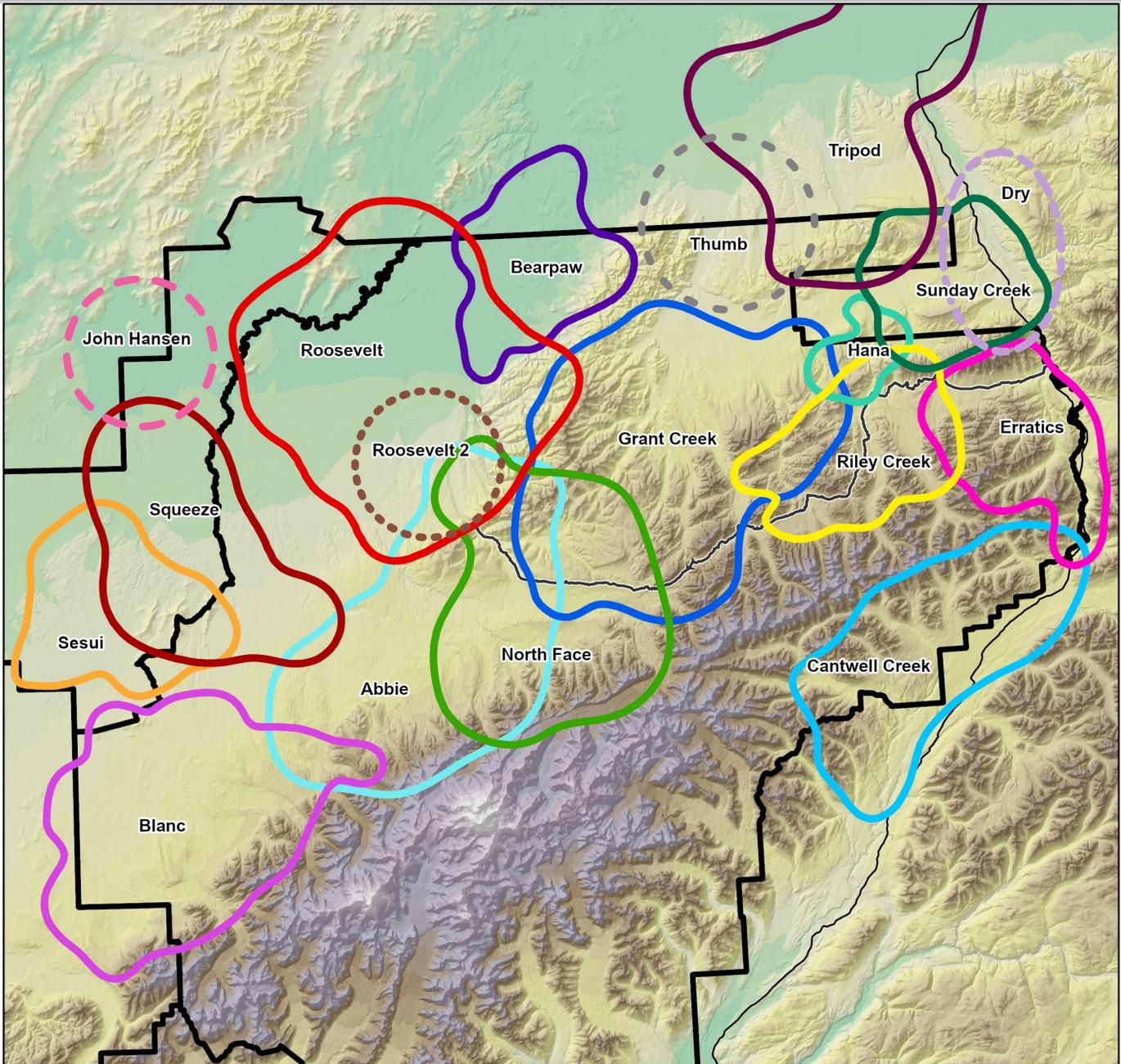
Reproduction and Mortality

2021

PACK	Spring Pack Count	Fall Pack Count	Reproduction		Mortality		Description
			Dennded	Fall Pup Count	Natural	Human-Caused	
Eastern Region							
Cantwell Creek	9	14	Yes	3		1	Harvested
Erratics	10	12	Yes	6			
Grant Creek	12	22	Yes	5	1		Killed by wolves
Hana	NA	6	NA	NA			
Riley Creek	7	11	Yes	4			
Sunday Creek	5	3	No	NA		1	Harvested
Tekla	1	0	NA	NA		2	Harvested
Western Region							
Abbie	6	8	Yes	4	1		Killed by wolves
Bearpaw	4	6	Yes	2		1	Harvested
Blanc	14	19	Yes	4			
John Hansen	4	0	NA	NA	1		Killed by wolves
North Face	5	4	Yes	2	1		Killed by wolves
Roosevelt	15	12	Yes	3			
Sesui	2	4	Yes	2			
Out of Study Area							
Tripod	3	NA	NA	NA			
TOTALS*	97	121		35	4	5	

*These numbers are not considered official population counts and may differ from official counts due to existence of lone wolves, dispersers, etc. Please consult <https://www.nps.gov/dena/learn/nature/wolf-research.htm#wolf-population-data> for official population figures.

Spring 2022 Population Map



Home ranges based on locations from April 1, 2021 - March 31, 2022.

Study Area Population Count March 2022: 97 wolves in 13 groups, Mean pack size = 7 wolves

John Hansen, Tripod, Thumb, and Dry packs not included in population count because majority outside the park.

Pack (Pack size as of 3/15/2022)	Grant Creek (18)	Sesui (4)
Abbie (7)	Hana (2)	Squeeze (8)
Bearpaw (8)	John Hansen (0)	Sunday Creek (3)
Blanc (14)	North Face (1)	Thumb (6)
Cantwell Creek (14)	Riley Creek (9)	Tripod (6)
Dry (2)	Roosevelt (8)	
Erratics (7)	Roosevelt 2 (2)	

Wolves and coyotes: Sharing space in Denali

Increased coyote abundance throughout western North America has been attributed to the extirpation of wolves and is considered by many to be an example of “mesocarnivore release.” Mesocarnivore release is defined as the expansion in range and/or abundance of a smaller predator following the reduction or removal of a larger predator. These effects can extend beyond the small carnivores to include their prey. These “ripple effects” throughout an ecosystem are known as trophic cascades. But determining if, how, and when these cascades occur is very complex. The expansion of coyote range into areas that retained healthy wolf populations, such as Alaska and Canada, suggest that more is going on.

In the summer of 2012, Dr. Laura Prugh of the University of Washington (then at University of Alaska Fairbanks), started a study on interactions between carnivore species in Denali and surrounding areas. One goal of the study was to determine which are the most important factors controlling mesocarnivore populations in the park, particularly those of coyotes. Is it suppression by wolves? Availability of prey? Habitat characteristics like snow? This information can be used to determine the strength of mesocarnivore release and resulting effects on the mesocarnivore community.

As part of this project, researcher Kaija Klauder analyzed data to tackle two different angles on the relationships between wolves and smaller carnivores. In the first, photo data from carcass sites allowed a better understanding of how different carnivores use this valuable but risky winter resource. Next, collar data from GPS collared coyotes who shared a landscape with GPS collared wolves was used to see how coyotes behaved in response to wolves. Those findings are shared here.

Coyotes and Wolves

Given the complicated relationship between wolves and coyotes, how exactly do coyotes respond to living in an area full of wolves? GPS collar technology offers an opportunity to get some answers.

From 2013-2016, nine coyotes were darted and fitted with GPS collars. These collars allowed researchers to gather some basic information on the coyotes, such as their home range size and

Staff collect data and collar two coyotes. NPS Photo



survival, as well as see how coyotes selected habitat in the park and how they respond to wolves. Coyotes certainly have reason to avoid wolves, which have a habit of killing coyotes. But coyotes might also benefit from being near wolves, by being able to scavenge, or just to make sure they don't get surprised. Or it could be that coyotes and wolves have similar needs for territory features. Consequently, the study examined how coyotes responded to wolves being nearby, and also how coyotes responded to areas that wolves use frequently (even if no wolves happened to be present).

Researchers found that coyotes maintain very large home ranges in Denali – an average of 291km², the largest on record! They also have low survival rates, and the biggest source of mortality was being killed by larger carnivores like wolves and bears. However, the results of the spatial analysis showed that coyotes did not universally avoid wolf risk. In the summer, coyotes tended to use areas away from wolves and away from regular wolf use. But in the winter coyotes switched to preferring areas closer to wolves and with high wolf use. There are two potential explanations for the fact of coyotes using the same areas as wolves in the winter. The first is that they might be doing so in order to scavenge. However in the part of the study that used cameras to monitor carcasses, coyotes barely scavenged at all, so it's not clear that this is sufficient explanation. Another reason might be that in the winter, animals need to be very careful about saving energy. They tend to

use the easiest travel routes through the snow – and what's easiest for a coyote is also what's easiest for a wolf, meaning they might end up using the same areas in the wintertime out of necessity. Overall the data showed that Denali is a very tough place to be a coyote, with limited food and a lot of competitors.



Two coyotes at an old den site. NPS Photo

Conclusions As is often the case with science, these studies generated as many questions as they answered. It seems clear that Denali is a challenging place to be a coyote, and that wolves probably aren't making it much easier. The studies, including the scavenging aspect, also revealed many ways in which different carnivore species impacted each other, sometimes quite strongly. However these did not resolve into a consistent pattern suggesting a clear hierarchy or “cascade” in which a specific species strongly flourished thanks to the presence or absence of another species.

For more information check out the following published papers:

“Living on the edge: spatial response of coyotes (*Canis latrans*) to wolves (*Canis lupus*) in the subarctic”

“Gifts of an enemy: scavenging dynamics in the presence of wolves (*Canis lupus*)”

Pack Narratives

EASTERN PACKS

Cantwell Creek

Pack Counts: Spring – 9 | Fall – 14

Collared Wolves: 2008GF, 2009GF, 2108GF, 2111GF

In early March 2021 2009GF began dispersing to the north and was trapped at the same time and place as Sunday Creek female 1921GF. During March captures we recollared 2008GF after collar failure, and also collared adult female 2108GF. Cantwell Creek pack first denned at a new site on the east side of Cantwell Creek, but later moved to an area near a known den between the Bull River and Costello Creek. In November 2021 we collared another adult female in this pack, 2111GF. The pack whelped at least 3 pups and likely more given the increase in pack size from 9 in the spring to a fall count of 14 wolves. The pack ranges along the north side of Broad Pass, in the Bull River, Cantwell Creek, and Windy Creek drainages.

HOW TO NAME A COLLARED WOLF:

1. Last two digits of the year
2. The order of wolves collared that year
3. One letter for the color of the wolf (G = gray, B = black)
4. One letter for the sex of the wolf (F = female, M = male)

How would you name this wolf? A gray female that was the 7th wolf collared in 2017.

Erratics

Pack Counts: Spring – 10 | Fall – 12

Collared Wolves: 2013GF, 2014GM, 2109GF, 2110GM

The GPS portion of 2014GM's collar failed in late February, and was last heard on VHF on March 3rd, leaving his fate uncertain. No additional wolves were collared in March 2021. The young 2013GF, though clearly not a breeder, allowed us to see that the pack denned in Carlo Pass, at a den site not recorded in use since 1994. The pack whelped 6 pups and had a fall count of 12 wolves. November 2021 captures added two collars to the pack: one on the presumed breeding female 2109GF and one on adult male 2110GM. Their territory ranges from the Park entrance area in the north to Cantwell in the south, and from the Savage drainage in the west to the highway corridor in the east.

Grant Creek

Pack Counts: Spring – 12 | Fall – 22

Collared Wolves: 1402GF, 1906GF, 1915GF, 2102GF, 2105GF

An additional Grant Creek wolf was collared in March 2021, yearling female 2102GF, and 1906GF was recollared. During the time of March captures, 1915GF had separated from the pack and was traveling to the south and west of the traditional territory with a companion. Her male companion, 2105GM, was collared, and the pair was designated as a new pack, named Surge pack. However, after their short bout away, in April both 1915GF and 2105GM reintegrated into the Grant Creek pack, with 2105GM and 2102GF taking a large foray to the northeast. Grant Creek pack had multiple breeding females during summer 2021. There was activity at the Wigand Flats Den and adjacent homesites, as well as denning activity at a new den on Stony creek. 1906GF is the presumed mother of the Stony litter, while the maternity of the Wigand litter is

uncertain; it may have been 1402GF, or an uncollared female. Long-time matriarch 1402GM died in late August, likely killed by other wolves. 2105GM apparently did not fully settle in to the pack, as he made several extra-territorial forays throughout the spring, and in early July he dispersed to the southwest, traveling as far as Blanc territory before eventually joining Abbie pack. The pack recruited at least 5 pups, and likely many more for a fall count of 22. No additional Grant Creek wolves were collared in November 2021. Grant Creek maintained their traditional large territory encompassing Wigand flats, the western Kantishna Hills, and the northern Wyoming Hills.

Hana

Pack Counts: Spring – NA | Fall – 6

Collared Wolves: 2114GF, 2115BM

This new pack of 6 was located and collared in November 2021, on the Sushana river. We collared two members, presumed breeding female 2114GF and adult male 2115BM. They maintain a small territory centered on the western end of the Stampede corridor.

Riley Creek

Pack Counts: Spring – 7 | Fall – 11

Collared Wolves: 1911GM, 2001GM, 2007BF

No additional Riley Creek wolves were collared in March of 2021. The pack again denned at the Teklanika den complex, where 2 black and 2 grey pups were captured on trail cam. Like the previous year, they moved to a rendezvous site on the Sanctuary River in late July, and despite the relative proximity of both den and rendezvous site to the road, this pack was rarely seen. 2001GM made several unusual forays into Grant Creek territory, spending time with 1906GF and visiting the Stony den site multiple times. It is unusual for an adult male from another pack to be welcomed in this manner. Riley Creek recruited 4 pups, for a fall pack count of 11. In November, we recollared 2001GM as his GPS tracking had begun to fail.



A Riley Creek pup as seen on a trailcam. NPS Photo

Sunday Creek

Pack Counts: Spring – 5 | Fall – 3

Collared Wolves: 1921GF, 2012GM, 2010GF

In early March of 2021, presumed breeding female 1921GF was harvested by trapping as the Sunday Creek pack encountered dispersing Cantwell Creek wolf 2009GF, who was also harvested. During March captures, we collared adult male 2101GM. In late March, 2101GM began traveling in the territory of sole remaining Tekla member 2010GF. He then began traveling with her, and then both animals rejoined 2012GM on traditional Sunday Creek territory. The three collared adults traveled together for the rest of the year. Sunday Creek did not show signs of denning, which is not surprising given the death of 1921GF and the fact that 2010WF was alone during the breeding season. The fall count was 3 wolves. No additional wolves were collared in November.

Tekla

Pack Counts: Spring – 1 | Fall – 0

Collared Wolves: 2006BM, 2005BM, 2010GF

2006BM, who had been traveling alone outside and within the territory, was trapped in State lands in the

Stampede corridor in mid-January. In late January, presumed breeding male 2005BM was trapped in the same area, leaving 2010WF alone until her incorporation into Sunday Creek pack at the beginning of April (see Sunday Creek pack).

Tripod

Pack Counts: Spring – 3 | Fall – NA

Collared Wolves: 2104BM

An unusual circumstance led to the monitoring of this group. While tracking, the fixed-wing pilot spotted some unusual tracks around a carcass. When the helicopter took a closer look, they found a wolf with a leghold trap and trailing chain stuck on its foot. We were able to dart the wolf, 2104BM, and remove the trap. 2104BM was otherwise healthy. He was part of a group of 3, but eventually dispersed north of the park outside the monitoring area, making frequent aerial observations impractical. There's no evidence that Tripod pack denned in 2021, and no additional wolves were collared in November. A look at this wolf in spring 2022 showed him with a pack of 6.

WESTERN PACKS

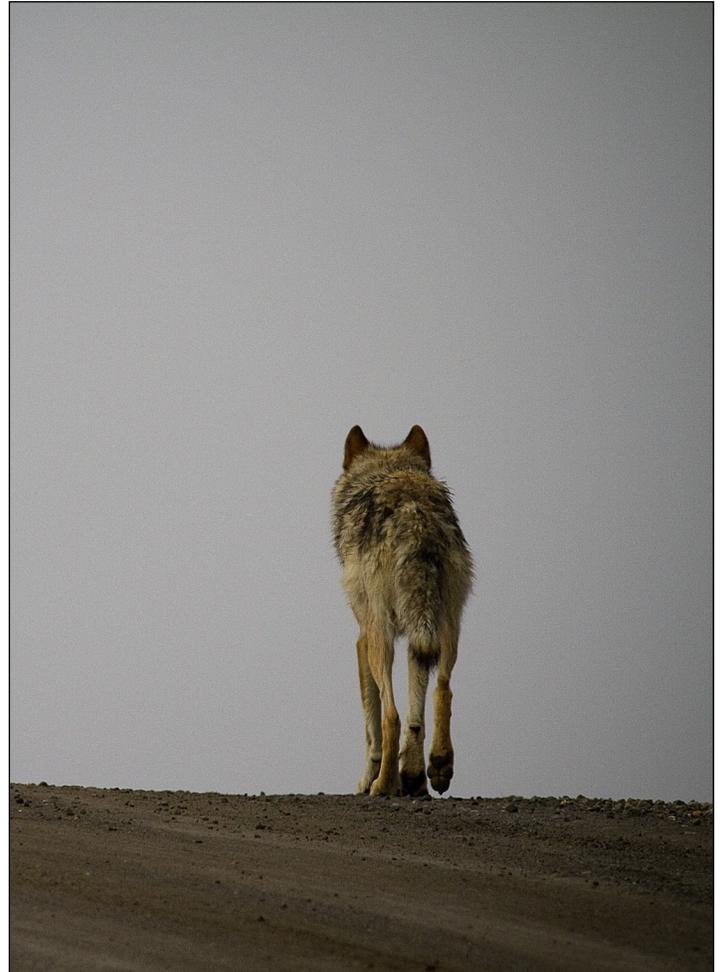
Abbie

Pack Counts: Spring – 6 | Fall – 8

Collared Wolves: 1910GF, 1916GM, 2111GF, 2105GM

Once again this pack was difficult to monitor. In the last few days of 2020, 2011GF was killed by Roosevelt pack, when they made an incursion into Abbie territory. Then 1916GM's collar failed entirely in early March, leaving his fate unknown. During March captures we were able to recollar 1910GF. Unfortunately, 1910GF dispersed to the northeast and began ranging in the Wonder Lake and Brooker Mountain area beginning in early May. She occasionally returned to central Abbie territory, but with decreasing frequency, and by September 1910GF picked up a companion. The remainder of the pack was seen using Slippery Creek den. Disperser 2105GM, from Grant Creek, entered Abbie territory in mid-July and

joined the pack sometime thereafter. November captures added one collar to Abbie pack, on a very pretty white female 2112GF. At the time of captures 2112GF and 2105GM were the only adults with the pack, suggesting that they could become the breeding pair. Abbie recruited 4 pups in 2021, for a fall count of 8 wolves. In early November, the dispersing female 1910GF was killed by other wolves north of Kantishna.



A wolf travels on the park road. NPS Photo

Bearpaw

Pack Counts: Spring – 4 | Fall – 6

Collared Wolves: 1805GM, 2002GM, 2103BF

In late January, 1805GM was trapped north of the Park boundary. In March 2021, we collared yearling female 2103BF. This pack again denned near Sandless Lake. The Bearpaw pack recruited at least 2 pups, for a fall count of 6 wolves. No additional animals were collared or recollared in November.

Blanc

Pack Counts: Spring – 14 | Fall – 19

Collared Wolves: 1908BF, 1918GF, 2106GM

In March 2021 we recollared 1918GF, and collared adult male 2106GM. In 2021, the Blanc pack returned to their old den site on the upper Swift Fork. 1918GF went on multiple extended forays over the spring, as far northeast as the western edge of Wigand flats, but ultimately rejoined the pack in mid-summer. Blanc recruited at least 4 pups, growing to a fall size of 19 wolves.

Blanc continues to range in the far southwestern corner of the park and beyond. No additional wolves were collared or recollared in November 2021.

John Hansen

Pack Counts: Spring – 4 | Fall – 0

Collared Wolves: 2003GM,

In early April 2021, 2003GM was killed by wolves, leaving the pack without any collared members.

North Face

Pack Counts: Spring – 2 | Fall – 6

Collared Wolves: 1917GM, 1920GF

No additional wolves in the North Face pack were captured in March 2021. The pack denned at Pirate creek and produced 4 pups, but it appears that only 2 survived to fall. The breeding female 1920GF died in mid-September, after having clashed with either other wolves or a bear.

In November a young adult male was collared, 2113GM, and the fall count was 4. They continued to range in the Wonder Lake/Moose Creek to Turtle Hills area.

Roosevelt

Pack Counts: Spring – 15 | Fall – 12

Collared Wolves: 1811GF, 1904GF, 1903BF

In March 2021 we recollared both 1811GF and 1904GF. In late March 1904GF headed east and began moving separately from 1903BF and 1811GF. She localized on

the western side of the Kantishna hills and did not appear to den. The remainder of the pack denned along the Kantisha River and recruited at least 3 pups, for a fall count of 12. The GPS portion of 1811's collar began to fail in the fall. No wolves were collared or recollared in Roosevelt pack in November.

Sesui

Pack Counts: Spring – 2 | Fall – 4

Collared Wolves: 1808GM, 2107GF

After a disastrous 2020, 1808GM made yet another go: in March, we collared his new companion, 2107GF. The pair denned again at the Herron-Castle den. It didn't seem as though the pair were successful at first, however, in October, the pair was seen with 2 gray pups in tow for a fall count of 4. The GPS portion 1808GM's collar failed in late May. No additional wolves were collared in November.



A collared wolf stretches in front of a trail camera. NPS Photo

Wolf Management

COLLARING

Denali has been collaring members of the wolf population since 1986 in order to track movements, estimate territory locations and sizes and estimate the population size and density. Current methods of wolf monitoring used in Denali follow the Wolf Monitoring Protocol for Denali National Park and Preserve, Yukon-Charley Rivers National Preserve, Alaska (Meier et al. 2009). In brief, this method involves capture and radio-collaring of one or two members of each wolf pack in the study area



Staff examine and document tooth wear during capture to assess age and health. This wolf is young and has teeth in excellent condition. *NPS Photo/Bridget Borg*

and locating and counting wolves during aerial tracking flights periodically through the year. Morphological data, including sex, weight, age and color, and blood and tissue samples for genetics and disease analysis, are gathered from captured wolves.

In 2021, staff captured and collared 22 wolves during two capture efforts, including 7 recaptures of wolves collared in previous years to replace aging or failed collars.

CLOSURES

Once closure around an active den site was put in place in 2021 following Denali's Wolf-Human Management Plan. The Wolf-Human Management plan stipulates that a closure will automatically be implemented around a den that was active in the previous two years, until it can be determined if the den is active or not.

Teklanika Wolf Closure

The Teklanika Wolf Closure was implemented on May 5th, 2021. The closure was lifted on August 18th 2021. The area closed encompassed areas south of the Teklanika bridge and along Igloo Creek.

Outreach and Collaborations

OUTREACH

- Wolf Research and Field Biology, College of the Atlantic conservation biology class, April 2021 — Kaija Klauder.
- Wolf Research in Denali, 2021 Resources Day Presentation, June 2021 — Bridget Borg
- Wildland Studies, citizen science pellet plot survey, July – Kaija Klauder
- Denali Learning Intensives, August 2021 — Kaija Klauder
- Wolves of Denali Field Course August 2021 – Bridget Borg
- Continued updates to wolf web page: <https://www.nps.gov/dena/learn/nature/wolves.htm>
- Interviews and field visits with independent filmmaker Ramey Newell for upcoming documentary “A Good Wolf.”

PUBLICATIONS

- Borg, B. L., Arthur, S. M., Falke, J. A., & Prugh, L. R. (2021). **Determinants of Gray Wolf (*Canis lupus*) Sightings in Denali National Park.** *Arctic*, 74(1), 51–66. <https://doi.org/10.14430/arctic72208>
- Brandell, E. E., Cross, P. C., Craft, M. E., Dubovi, E. J., Gilbertson, M. L. J., Wheeldon, T., & Hudson, P. J. (2021). **Patterns and processes in pathogen exposure in gray wolves across North America.** *Scientific Reports*, 11 (3722) <https://doi.org/10.1038/s41598-021-81192-w>
- Klauder, K., Borg, B., & Prugh, L. (2021). **Living on the edge: spatial response of**

coyotes (*Canis latrans*) to wolves (*Canis lupus*) in the subarctic. *Canadian Journal of Zoology*, 99, 279–288. <https://doi.org/10.1139/cjz-2020-0050>

- Klauder, K. J., Borg, B. L., Sivy, K. J., & Prugh, L. R. (2021). **Gifts of an enemy: scavenging dynamics in the presence of wolves (*Canis lupus*).** *Journal of Mammalogy*, 102(2), 558–573. <https://doi.org/10.1093/jmammal/gyab020>

COLLABORATIONS

- Wolf Hunting adjacent to National Parks: measuring impacts to wolf populations, pack stability and long-term research. Collaboration with Yellowstone and Grand Teton National Parks and Yukon Charley National Preserve
- Linking seasonal snow processes to wildlife population dynamics, NASA ABoVE campaign, Dr. Laura Prugh
- Genetic and genomic effects of harvest on a cooperatively breeding carnivore, USGS NRPP award and collaboration with University of Idaho

READING WOLF BEHAVIOR: WHAT IS THIS WOLF COMMUNICATING?



Neutral

A wolf that has its ears slightly forward or slightly back, is walking or trotting, and may only glance in your direction is neutral about your presence. Enjoy the lucky sighting and do not try to attract its attention.

NPS Photo



Curious

A wolf that fixes its gaze on you with its ears up is curious. It may approach slowly or walk around you to get a better look. Curious behavior usually results in the wolf leaving once it realizes you are a human. If the wolf follows you or shows interest in tents or vehicles, encourage it to leave by shouting and waving your arms.

NPS Photo



Howling

Wolves howl to communicate with pack members, often as a chorus. Wolves will howl to gather the pack or to communicate with pups. Howls may also be used as a warning to other wolves to stay away. Enjoy this sound of the wild!

NPS Photo

Interactions between wolves and humans are very rare. If you do see a wolf, pay attention to its behavior to determine how to respond.



Fearful/Defensive

A wolf with its ears pinned, hackles up, crouching, with lips pulled back and tail between its legs is acting out of fear or defending itself. Back away quickly and give it space. Barking or bark-howling by wolves is also a sign that you are too close. Leave the area if you hear this.



Aggressive/Predatory

Aggressive or predatory attacks on humans are extremely rare. If a wolf has its eyes fixed on you, ears forward, is standing tall, and has its tail up, it is acting dominant and may become aggressive. A predatory wolf may stalk with head lowered and gaze fixed, or rush directly at its prey. **DO NOT RUN.** Shout, make noise, and be tough.

WHAT SHOULD I DO IF A WOLF APPROACHES ME?

Wolves are wild animals! Stay at least **25 yards** away from wolves at all times. Never feed a wolf. If a wolf approaches you in a predatory or aggressive manner, or is curious and not leaving, **DO NOT RUN!** Get tough! Shout aggressively and make other loud noises, maintain eye contact, and throw rocks.

2021 Annual Wolf Report

