

# Denali National Park and Preserve 2012 to 2016 Wolf Pack Narratives

NOTE: Pack narratives span from May 1, 2012 to July 28, 2016. Pack names are followed by the spring 2016 pack count.

Wolf identification numbers are created as follows: first two digits refer to the year they were first collared, second two digits are assigned sequentially to wolves collared for the first time that year, the first letter indicates the color of the wolf (G-gray, B-black) and the second letter indicates the sex (F-female, M-male). Thus 0811GM is a gray male wolf that was the 11<sup>th</sup> wolf collared in 2008.

## **Eastern Packs**

### ***Nenana River (unknown number of wolves, no longer monitored as of August 2015)***

In spring 2012, the Nenana River pack was comprised of four individuals: 1105GM, the three year old breeding male and 0905GF, the five year old breeding female and two yearlings from the prior year's breeding. The pack raised four pups at a den site above Hines Creek, and there were a total of eight wolves in the pack in fall 2012. During the summer, the pack traveled between the Savage and Nenana River and south of Mount Healy. During fall and winter 2012-13 the pack primarily traveled south and east of their summer territory and were seldom within the park boundary. In spring 2013, the pack numbered seven individuals, indicating that at least one uncollared wolf dispersed or died over the winter.

**September 2013 Update:** The Nenana River pack was seen at several times during summer 2013 at a presumed den site outside of the park to the east. No pups were confirmed visually. On August 13, 2013, 1105GM and three other pack members were legally shot approximately nine km outside of the park by a hunter. The hides were sealed and the collar from 1105GM was turned in to the Alaska Department of Fish and Game on August 16, 2013. The hunter reported seeing a total of six pack members. There is no information on whether any of the wolves seen or shot were pups. The collared female, 0905GF, was seen alone on August 16.

**November 2015 Update:** Since fall 2012, the Nenana River pack has consistently been located east of the park boundaries and monitoring of the pack has been limited following the shift in pack territory outside of the park boundaries.

The fall 2013 count for Nenana River pack was nine individuals. In spring 2014, we counted 10 individuals with the remaining collared wolf, 0905GF. There was a suspected den site in the Yanert Valley in summer 2014 and four pups were confirmed. By November 2014, a total of 14 wolves were counted in the Nenana River pack. However, in January and February 2015, several flights counted a total of 22 wolves in the Nenana River pack in the Yanert Valley. In April, 0905GF was located near a den site used in 2013 but no pups were seen. In August 2015, 0905GM was found deceased near the den site. A field necropsy indicated that 0905GF was in poor condition, with no subcutaneous fat and likely died due to starvation.

### **Grant Creek (8 wolves)**

The Grant Creek pack experienced a dramatic decline in numbers in 2012, from 15 members in spring 2012 to three members in spring 2013. This decline potentially resulted from the loss of two breeding females in spring 2012. In March 2012, the Grant Creek pack numbered 15 members with three collared individuals, six year old breeding male 0811M, seven year old breeding female 0719GF, and three-year old female 1103GF. Wolf 0719F was the breeding female in the Grant Creek pack and raised pups in 2008, 2009, and 2010. However, in 2011, it is suspected that 1103F was the only female in the Grant Creek pack that whelped pups (four pups). In early April 2012, 1103F was legally trapped near a horse carcass less than a mile outside the park boundary on the west side of the Savage River. Wolf 0719F died near the East Fork Aspen wolf den in mid-May of 2012 of unknown natural causes. The carcasses of 1103F and 0719F were scavenged before the carcasses were recovered, making it impossible to tell whether they were carrying pups at the time of mortality.

GPS data indicated that Grant Creek wolves were still frequenting the East Fork Aspen den area after the death of wolves 0719F and 1103F. On June 13 and 14, 2012 NPS biologists observed the Grant Creek wolves at or near the den site for over 12 hours. That was the last time ground or aerial observers noticed the wolves using the den site. At that time, there were six wolves in the pack including the breeding male, wolf 0811M.

On August 8, 2012 wolf 0811M was observed with three other wolves at mile 60 along the park road. A seasonal wildlife technician noticed one of the wolves had visible nipples, an indication that this female may have had pups or lactated earlier that season. However, during subsequent aerial and ground observations, no pups were seen. It is possible that there was a third breeding female within the pack (observed August 8) but that the pups failed to reach recruitment age. All sexually mature females exhibit a long post-ovulation phase, often called pseudopregnancy, during which there is no hormonal difference between pregnant and pseudopregnant females (Seal et al 1979, Asa et al 1986, Kreeger et al., 1991). Thus, all females that ovulate are hormonally primed to show maternal behavior and some may even lactate (Asa 1998) following pseudopregnancy.

From July to November 2012 five wolves were observed consistently in the pack, which ranged widely over the territory formerly occupied by the larger pack of 15 and additional regions south of the Alaska Range.

Other members of the Grant Creek pack may have dispersed, died, or the pack may have split, resulting in two smaller packs that either share the same territory or use exclusive territories. However, extensive aerial tracking in fall 2012 and spring 2013 has not located an uncollared pack within the region formerly used by the Grant Creek pack.

By February 2013, there were only three members left in the Grant Creek pack, the collared breeding male, wolf 0811M and two other gray colored wolves. One of 0811M's companions was captured and collared in March 2013. This newly collared female, 1301F was estimated to be two years old at the time of capture. From capture in March 2013 to mid-April 2013, 1301GF traveled independently of 0811GM. In mid-April 2013, 1301GF was shot near Cantwell with an

uncollared gray male companion. Since April 0811GM has been seen repeatedly with one gray companion. In spring 2013 0811GM and his companion were confirmed to be denning at the East Fork Aspen den.

**September 2013 Update:** The Grant Creek pair denned at the East Fork Aspen den site in 2013 and produced five pups. The pack moved from the East Fork Aspen den to the Murie Den in July and used the Murie Den site as a rendezvous site summer 2013. The Murie Den site is the den site where Murie observed a wolf pack in 1940 and 1941 and made his observations later made famous in “The Wolves of Mount McKinley.” The Grant Creek adults and pups have been seen occasionally along the park road during the summer of 2013.

**November 2015 Update:** At least since 2012, the Grant Creek pack has shown a tendency to have a seasonal shift in territory. The pack has consistently denned along the park road during the summers and during winters split time between areas along the Toklat River drainages near the park road corridor and in mountainous terrain south of the Alaska Range.

In fall 2013, the Grant Creek pack numbered seven individuals, composed presumably of the breeding pair and their five pups from spring 2013. The pack count remained the same in spring 2014. A gray female in the Grant Creek pack was collared in March 2014 (1404GF). The pack denned at the East Fork Aspen den site again in 2014.

0811GM’s collar indicated it was in mortality mode in late June 2014. 0811GM was found in deceased in near a small stream with no major wounds and average body condition. He was a very old wolf (over 10 years old) and it was determined that he died from unknown natural causes.

Four pups were observed near the Aspen den site in early to mid-June, but they appeared smaller than other pups the same age in other packs. By late June/early July only two pups were observed during aerial tracking and from wolf sightings along the park road. The fall 2014 pack count was four wolves and the count remained the same through spring 2015.

In March 2015, a two-year old gray male (1501GM) was collared from the Grant Creek pack. 1404GF was near the East Fork Aspen den by late May 2015 and in late August seven pups were confirmed. By September only two pups were seen with the two collared adults. Two additional uncollared wolves were also seen with the pack in fall 2015 bringing the pack count for fall 2015 to six individuals.

**May 2016 Update:** In February 2016, 1602GF, a pup from the Grant Creek pack was collared in the south Wyoming Hills area. The spring pack count was eight. The pack appears to be denning at the Murie den site this year (see September 2013 update above).

**July 2016 Update:** 1404GF denned at Aspen den site, using the nearby Murie den site as a rendezvous site later in the summer. She was seen with 5 gray pups on 7/25/2016. 1602GF has been predominantly south of the Alaska Range at a presumed den site along the Chulitna River. 1501GM has been at both den sites. On 7/26/16, 1602GF and 1501GM were seen near Costello Creek, with 6 pups. The two den sites are over 18 miles apart and separated by the main Alaska Range with high passes and glaciers.

### ***East Fork (2 wolves)***

At nine members in spring 2013, the East Fork pack was the largest pack in the eastern region of the park and occupied a territory in the north eastern corner of the park, traveling frequently in and out of the park boundaries. In spring 2012, there were eight members in the East Fork pack, five gray and three black wolves. There were a total of four wolves collared in the East Fork pack from spring 2012 to September 2012, when two collars automatically released and were recovered. These short term collars were placed on wolves in three eastern region packs (East Fork, Grant Creek and McKinley Slough) as part of a wolf viewing study and were programmed to release automatically from the wolves in September 2012.

Interestingly, because we monitored additional wolves in the pack, we discovered that that the East Fork pack used two den sites located 12 miles apart in summer 2012. If we had only monitored the dominant breeding female, 0618GF, a nine-year old wolf, it is unlikely that we would have located the second den site. 1203BF, a two-year old wolf collared for the wolf viewing project, denned along the Sanctuary River in 2012 and produced at least 4 pups. The other two collared wolves, 1201GM, a three year old male collared with a short term collar, and 1202BF, a four year old female, alternated between the two den sites throughout the summer. Even the breeding females, 0618GF and 1203BF visited their pack mates' den sites, as indicated by GPS and aerial tracking data. Prior to 2012, the East Fork pack used the same den site (or various dens near the same location) on the Teklanika River for 13 consecutive years.

By August 2012, four pups (one black, three gray) of unknown maternity and all adults were traveling near Sanctuary and appeared to have joined and used a rendezvous site across the river from the Sanctuary den. In November 2012, the East Fork pack was up to 13 members (nine adults, and three pups). By the end of March 2013, the East Fork pack numbered eight wolves (three black and five gray). It is unknown if the overwinter decrease was due to dispersal, natural mortality or harvest. No collared wolves were known to be harvested as of the end of April 2013.

**September 2013 Update:** Both 0618GF and 1202BF appeared to attend the same den site during the summer of 2013 and we confirmed use of at least one den and one rendezvous site located outside of the park this summer.

**November 2015 Update:** By late September 2013, at least four pups (two gray, two black) were confirmed in the East Fork pack. However, by November 2013, a total of 20 wolves were seen traveling with 0618GF. It is unknown if this increase in pack size was due to a second litter of pups in the pack that was previously undetected or if other wolves joined the pack.

1202BF had not been seen or heard with 0618GF since late September and by spring 2014, 1202BF had joined with an uncollared black male wolf and formed the Riley Creek pack. The pair was seen several times in May at probable den site along Riley Creek, but started using a den site above Hines Creek in the beginning of June. The Hines Creek den site is the same one that was used by the Nenana River pack from 2009 to 2012.

One young male wolf from the East Fork pack, 1308GM, collared in December 2013, dispersed over 200 miles from Denali starting in May 2014, eventually settling down in Yukon-Charlie National Preserve. Details of this trip were posted on the Murie Science and Learning Center's Research Highlights web site at: <http://www.nps.gov/articles/wolf-dispersal.htm>.

In March 2014, a 10-month pup from the East Fork pack was collared with a VHF collar (1403GM). The spring 2014 pack count for was 15 wolves in the East Fork pack. In summer 2014, 0618GF was seen using the same den site north of the park and at least three pups were seen by late summer. The fall 2014 count for the East Fork pack was 17 wolves.

1403GM died during late February 2015, after becoming caught in a snare set outside the park. The wolf was able to break free from the snare's anchor wire and return to the park, but subsequently died due to blood loss caused by the snare.

In March 2015, the East Fork pack numbered 14 wolves and two additional males in the pack were collared: 1507GM and 1508GM. In May 2015, 1507GM and an uncollared female were legally shot by a hunter outside of the park near the Stampede Trail. GPS data provided by the 1507GM's collar indicated that he had spent most of the week before his death scavenging at a bait station established by a bear hunter within a mile of the location where he was shot.

In mid-July 2015, it was noted that 0618GF's collar was in mortality mode. A necropsy revealed a small puncture on her lower back, just below her spine, that had perforated a major artery, leading to internal bleeding and subsequent death. The puncture was caused by an unknown, natural cause, most likely obtained in a fight with another animal. Although speculative, the injury is reminiscent of injuries sustained by young lambs or calves when grabbed by Golden Eagle talons. 0618GF was one of the ten oldest wolves we've monitored in the park since 1986 and in spite of her age (estimated at over 10 years) she was in good condition at the time of her death.

Following the death of 0618GF, a total of four wolves have been counted with the remaining collared wolf, 1508GM. The fate of the other East Fork pack members is unknown. Thus far, no other pack members or tracks of other wolves in their territory have been found during several extensive aerial tracking flights during the fall of 2015. It may be unlikely, but the possibility remains that additional members may join the pack this winter, or that additional flights with good conditions will allow for discovery or tracking of additional wolves in their territory.

**May 2016 Update:** In mid-February 2016 another male from the East Fork pack was collared (1607GM). In late February, 1607GM dispersed north and was shot in March 2016 west of Fairbanks near the Chatanika River. The spring pack count for the East Fork pack was two- 1508GM and an uncollared black wolf companion. On 5/4/16, the remaining collared wolf, 1508GM was seen near a site used by the Pinto Creek pack as a rendezvous in 2007. On 5/7/16, 1508GM was seen near a presumed hunting camp outside of the park. Later in the day the collar was heard from inside of the camp. No further data has been received from the collar and it is presumed that this wolf was shot and the collar subsequently destroyed. On May 15<sup>th</sup>, a dark gray or black wolf was seen at a den hole near the Pinto Creek pack rendezvous site, near the same location where 1508GM was seen on 5/4. The black wolf at this den was likely the same wolf that was previously seen with the presumed killed 1508GM.

**July 2016 Update:** During numerous flights to check the status of the Pinto Creek den site, a total of two pups were seen (one black and one gray) in early June. One pup (gray) was seen later in the month, with the last sighting on 6/28. The black female was seen at the den site on 5/23 and was not observed at the den site during subsequent checks. On 7/24/16, after a period of heavy rains, new vegetation was observed growing at the entrance of the den site, a clear sign that the den was no longer being used. On 7/26/16, park biologists landed near the site and completed an investigation of the den site. As seen from the air, there was new vegetation around the entrance to the den site and evidence that the most recent use of the den was by porcupines. Numerous hair samples were collected and fecal samples were swabbed and will be submitted for genetic testing. Nothing else found at the den site area- no carcasses or signs of recent use by the wolves.

Without a collar on the black female, it is impossible to know the fate of her and the pups. Extensive aerial tracking this fall and winter may yield new information about the presence or absence of this wolf or others in the area. Hopefully, with the genetic information from the samples collected near the den site, we should be able to verify if any wolves found and collared in future months are indeed the same female or descendants of the black female. Although it is unfortunate to lose track of this long-tenured and well followed pack, it should be noted that the potential loss of this pack does not mean the loss of the lineage of these wolves. Indeed, the Riley Creek pack was founded by a female (1202BF) that was originally collared as a member of the East Fork pack in 2012 and founded a new pack with a mate in fall of 2013 (see full Pack Narrative above). This summer, one of 1202BF's pups, 1601GM, has dispersed and found a potential mate and appears to be eking out a new territory as well (see New Pair).

### ***McKinley Slough (2 wolves)***

The McKinley Slough pack experienced a dramatic decline from 2012 to 2013, dropping from 15 members in spring 2012 to only five members in fall 2012 and spring 2013. Similar to Grant Creek, this decline in pack size may be a result of the loss of a breeding female, six year old 0702GF, who died of unknown natural causes three miles southeast of Diamond in July 2012. The McKinley Slough pack used a potential den site near Little Bear and Alder Creek in 2012, although the den location was never confirmed. There was only one pup seen with the adult pack members in the fall.

Wolf 1211GF, a four-year old female was the only collared member of McKinley Slough pack from July 2012 to March 2013. She was seen with five other wolves in spring 2013 and one of her companions 1306GM, was collared in March 2013. 1306GM was collared on Chitsia Mountain on March 4, 2013, weighing in at 116 lbs. 1306GM's general body condition was excellent, but he had no apparent testes and a short and deformed penis perhaps from a birth defect or injury. No other abnormalities were observed.

1107GM, a two year old male collared as part of the wolf viewing project dispersed from the pack beginning in June 2012. 1107GM departed the park near Bearpaw Mountain and traveled northwest, eventually reaching the Seward Peninsula, over 350 miles straight line distance in less than a month. The GPS collar on 1107GM was a short term collar, and automatically released in September 2012. The collar was retrieved by personnel working with the Western Arctic National Parklands in late September 2012.

There appears to be a unique relationship between the Iron Creek East pack and the McKinley Slough pack. Two collared females of McKinley Slough were observed, via GPS and aerial tracking, to spend a period of time alternating between the Iron Creek East pack and the McKinley Slough pack before eventually joining the Iron Creek East pack. 1106GF was captured in March 2011 as a two year old McKinley Slough member. By July 16, 2011 GPS data indicated that she was traveling with Iron Creek 1108GM. However, by the end of November 2011, 1106GF was traveling with McKinley Slough again. In March 2012, 1106GF rejoined 1108GM and was officially renamed as the Iron East pack.

1205GF was collared in March 2012 as a four year old member of the McKinley Slough pack. She traveled alternatively with McKinley Slough and Iron Creek East throughout the summer months in 2012 until she appeared to associate solely with the Iron Creek East pack and was renamed as an Iron Creek female in September 2012.

**November 2015 Update:** There was no clear evidence that this pack successfully denned or raised pups in either 2013, 2014 or 2015. The collared male, 1306GM, is still with the pack, as is a gray female, 1402GF, that was collared as his companion in March 2014. We hypothesize that the lack of successful recruitment in this pack may be attributed to the dominant male's inability to reproduce due to the deformity in his reproductive organs. The fall 2013 and spring 2014 count for this pack was four individuals and only the two collared wolves (1306GM and 1402GF) have been seen in this pack since fall 2014. The fall 2014, spring 2015 and fall 2015 count has remained at two individuals.

**May 2016 Update:** In February 2016, 1402GF was recollared. Attempts were made to recollar her mate, 1306GM, but he evaded capture by staying in thick trees along the East Fork River. The spring 2016 count remained at two wolves.

**July 2016 Update:** The McKinley Slough pair continue to range in the Kantishna Hills and along the confluence of the East Fork and Toklat Rivers this summer, with some movements as far south as the headwaters of Boundary Creek in late June and early July. There is no evidence of denning.

### **Myrtle (6 wolves)**

In March 2015, we located tracks of an uncollared pair of wolves near VABM Myrtle. Both wolves were collared- 1503BM and 1504GF. In summer 2015, the Myrtle pair denned at the Glen Creek den, which was previously used by the Iron Creek East pack in 2012 and the McKinley Slough pack from 2005 to 2009.

Two gray and one black pup were seen beginning in July 2015. Sometime in early October, it appears that an additional black adult wolf joined the Myrtle pack.

In October 2015, we recollared 1503BM to replace an accelerometer collar that was scheduled to fall off later in the month as part of a research project on wolf movements initiated by a graduate student at the University of Santa Cruz. When we recollared this male, we noticed several

puncture wounds on head and severe swelling on his muzzle, perhaps the result of injuries sustained in a fight with another wolf. From subsequent observations of 1503BM it appeared that he was recovering from his injuries and continued to travel with the pack. The fall 2015 count for the Myrtle pack includes two black adults, one gray adult, two gray pups and one black pup for a total of six wolves.

**May 2016 Update:** In February 2016, a large black male from the Myrtle pack was collared on the north side of Brooker Mountain. The spring 2016 pack count was six wolves, unchanged from the fall 2015 count.

**July 2016 Update:** The Myrtle pack is ranging along Moose Creek as far west as Kantishna and east to Stony Creek. The pack denned along Glen Creek and 2 black pups were seen on 7/25/16.

### ***Riley Creek (7 wolves)***

The Riley Creek pack was formed by 1202BF, formerly an East Fork wolf, and a black male companion in fall 2013. 1205BF had not been seen or heard with the East Fork pack beginning since late September 2013 and by spring 2014, 1202BF had joined with an uncollared black male wolf and formed the Riley Creek pack. The pair was seen several times in May 2014 at probable den site along Riley Creek, but started using a den site above Hines Creek in the beginning of June. The Hines Creek den site is the same one that was used by the Nenana River pack from 2009 to 2012.

In summer 2014, the Riley Creek pack raised four pups (two gray and 2 black), bringing the fall 2014 pack count to six members. In November 2014, the black/dark gray breeding male was collared- 1406DGM. Five wolves were still in the pack in spring 2015 including the collared breeding pair and the pack denned at the same location as in previous years and raised five pups (four black, one gray). The fall 2015 pack count included four adults and the five pups for a total of nine wolves.

**May 2016 Update:** In February 2016, a 2 year old male from the Riley Creek pack was collared with an Iridium collar. The spring 2016 pack count for the Riley Creek pack was seven, down two from the fall 2015 count. The Riley Creek pack appears to be denning along the Sanctuary River this year, a change from the den site used in the previous two years.

**July 2016 Update:** The Riley Creek pack ranges west of Parks Highway along Riley Creek, the Park Road to just west of Sanctuary and north to Refuge Valley. In mid-May, 1601GM separated from 1202BF and 1406BF (see NEW PAIR). 1202BF and 1406BM denned along the Sanctuary River and have been using rendezvous sites in the nearby area. There have been no confirmed pups counts for the pack yet.

### ***NEW PAIR (2 wolves)***

In mid-May, 1601GM separated from 1202BF and 1406BF and the rest of the Riley Creek pack. Since this time, 1601GM has been ranging primarily along the Park Road corridor from Toklat west to Wonder Lake and Kantishna. He seems to be using areas sandwiched between the Myrtle pack to the north and the Eagle Gorge pack to the south. In July 2016, 1601GM has been seen with a smaller gray companion, presumably a female.

## **Western Packs**

### ***Bearpaw (9 wolves)***

The Bearpaw pack numbered six individuals in spring 2012. Bearpaw denned near lower Flume Creek summer 2012 and produced five pups (four gray and one black). By fall, the Bearpaw pack was the largest pack in the western region of the park, with a pack size of eight. Unfortunately, both dominant individuals in the pack died during the winter. The dominant female, 0415GF died of unknown natural causes near Flume Creek. The dominant male, 1206BM, a four year old, died in early winter near Chitsia and Flume Creeks due to uremic poisoning and dehydration secondary to paralysis. The cause of paralysis was undetermined. The remaining collared member, 1006BF, a two year old female has been traveling with the remaining members of the pack (presumably all pups). In March 2013, one of the pups, 1307GF was collared in the Bearpaw pack, although GPS data from spring 2013 indicates that 1307GF may be dispersing northwest of the park.

**November 2015 Update:** 1307GF was consistently alone near the north boundary of the park from March 2013 when she was collared, until May 2015, when her collar was located in mortality mode north of the park boundary. We have been unable to recover the collar due to its location and the cause of death for this wolf is unknown.

From fall 2013 to spring 2014, the remaining collared Bearpaw member, 1006BF, was alone. In May 2014 she was seen with a gray companion. In March 2015, her companion was collared-1502GM. In May 2015 both collared Bearpaw wolves were located at the 2012 Bearpaw den site near Otter Creek. By October, we confirmed at least six pups (four gray, two black) with the collared pair for a fall 2015 count of eight in the Bearpaw pack.

**May 2016 Update:** In February 2016, a gray yearlong from the Bearpaw pack was collared (1606GM). The spring 2016 pack count for the Bearpaw pack was 9, up one from the fall 2015 count. 1006BF was located at a known den site near “Bearpaw Lake”. It is considered the 2<sup>nd</sup> oldest known den site in the park.

**July 2016 Update:** The Bearpaw pack uses a territory along the Bearpaw and Flume Rivers, along the northern boundary of the park. This year the pack denned near “Bearpaw Lake”, at a den site considered one of the oldest known den sites in the park. No pups have verified yet.

### ***Eagle Gorge (2 wolves)***

In March 2015, a two-year old male wolf (1506GM) in the John Hansen pack was collared with an accelerometer collar as part of a study in collaboration with the University of Santa Cruz. Starting in April 1506GM was occasionally apart from the other collared male in the John Hansen pack (1302GM) and seen with one uncollared gray companion. Beginning in September 2015, 1506GM was consistently well south of the John Hansen territory and has localized in the Eagle Gorge- McKinley Bar- Turtle Hill area with one uncollared companion. As of fall 2015, 1506GM and his companion are considered a new pair, named Eagle Gorge.

**May 2016 Update:** In February 2015, the light gray companion of 1506GM was captured and collared near McKinley River, south of the Muddy River. The spring 2016 pack count remained at two wolves. Denning status is currently unknown.

**July 2016 Update:** Ranging along McKinley Bar, north to Brooker and south to McGonagall Pass. The Eagle Gorge pair denned along Pirate Creek. Two gray pups were seen in July, but one pup was killed by a grizzly bear and only one pup remains with the two collared adults as of July 26.

### ***Hot Slough (no longer exists)***

In 2012, the Hot Slough pack occupied the northwest corner of the park west of Herron River to Munsanti Ridge and experienced a decline from nine members in spring 2012 to four members in spring 2013, due to splitting of the pack. During the spring 2012, Hot Slough 1008BF, a two year old, split from 0805GF and other Hot Slough pack members and denned near Telida. It is unknown if she had pups. It did not appear that 0805GF or other members of Hot Slough denned or raised pups in 2012. In March 2013, three year old male 1304BM was collared in the Hot Slough pack and is suspected to be the breeding male of the pack.

**November 2015:** In addition to 1304BM and 0805GF, there were two other wolves in the Hot Slough pack in spring 2013 (a total of three gray and one black). From fall 2013 to spring 2014, there were three members in the Hot Slough pack. In early March 2015, 0805GF's collar signal indicated mortality mode. We recovered the wolf's head and collar at the base of a steep bank, which was indicative that another wolf or wolves killed 0805GF. The remaining companion with 1304BM was collared in March 2015- 1505GF. In mid-May 2015, 1505GF was found deceased near a den site southeast of Minchumina. Since May 2015, no other wolves have been seen with 1304BM.

**May 2016 Update:** In January 2016, 1304BM was found dead near Lake Minchumina. Based on a field investigation, 1304BM appeared to have died from starvation.

### ***Hot Slough West (? wolves)***

During the spring 2012 Hot Slough 1008BF, a two year old, split from 0805GF and other Hot Slough pack members and denned near Telida. It is likely, given her tenure at the den site that 0805GF had at least one pup, but no pups were ever seen. In September, 0805GF was together with 1008BF nine miles northeast of Telida. It was the farthest west 0805GF had been seen previously. In subsequent observations, 0805GF has been east with four other pack members. 1008BF remains localized in a territory (?) out of the study area.

### ***Iron Creek East (no longer exists)***

In 2012, the Iron Creek pack split into two smaller packs, named the Iron Creek East and Iron Creek West packs. Iron Creek East pack primarily ranged from the south end of the Kantishna Hills to Turtle Hills and denned along Glen Creek in 2012, although pups were never seen at this

den site. The fall 2012 pack size was three following the death of 1106GF and 1108GM. The pack size in spring 2013 remains at three wolves.

1108GM was collared in March 2011 as a member of the Iron Creek pack and died September 2012 of starvation due to a rare oral melanoma that impacted its ability to hunt and eat.

1106GF joined the Iron Creek East pack in spring 2012 after traveling with both the McKinley Slough and Iron Creek East packs alternately for much of 2011 (see McKinley Slough pack narrative). In August 2012, 1106GF died of unknown natural causes near the confluence of Boundary and Stony Creeks.

1207GF, five year old female, originally collared in 2012 as a member of the Iron Creek Pack and 1205GF, originally a member of the McKinley Slough pack (see McKinley Slough pack narrative) together with one other companion currently form the Iron Creek East pack.

**November 2015:** In summer 2013 the Iron Creek East pack denned at the Glen Creek den site and two pups were confirmed bringing the fall 2013 pack count to five individuals. By the end of November we noted the mortality of 1205GF, likely due to injuries sustained from other wolves.

In spring 2014, there were four wolves in the pack and one 1401GM was collared in March. In May 2014, the Iron Creek pack denned at a den site near Wonder Lake and one pup was seen in July. However, the Iron Creek East pack disappeared after both collared adult wolves died in September 2014. The breeding female (1207GF) died of starvation and her mate (1401GM) subsequently dispersed eastward. He evidently drowned while crossing the Toklat River, which was swollen from recent heavy rains. In March 2015, a new pair was located and radiocollared in the range previously occupied by the Iron Creek East pack. This pair was dubbed the Myrtle pack.

### ***Iron Creek West (14 wolves)***

In 2012, the Iron Creek pack split into two smaller packs, named the Iron Creek East and Iron Creek West packs. The Iron Creek West pack ranged between the McKinley and Foraker Rivers, just north of the Alaska Range and south of the Park Road. They used a den site just west of the Foraker River, however no pups were ever confirmed. The pack fell from seven wolves in fall 2012 to two wolves in spring 2013.

1001GF, originally collared as a pup in 2010 as member of Iron Creek pack, died from apparent injuries from other wolves near McLeod Creek in February 2013. The remaining collared wolf in the pack, 1208GF, was originally collared in March 2012 and continues to travel in the Iron Creek West Territory with one companion.

**November 2015 Update:** The Iron Creek West pack is the largest pack in the park as of fall 2015 with a pack count of 15 members. Following a decrease to two members in spring 2013, the pair denned south of McLeod Lake near a glacial erratic rock pile and raised four pups for a fall pack count of six members in fall 2013. The pack count remained at six wolves in spring and fall 2014. A light gray male 1405LGM, was collared in the Iron Creek West pack in March

2014. It appeared that in 2014, the pack denned at a new den site west of upper Foraker and two pups were seen. By spring 2015, there were seven wolves in the Iron Creek West pack, apparently picking up an additional gray wolf over winter. In 2015, the pack denned at a den site previously used by the McLeod 2 pack in 2007. At least six pups were confirmed at the den site. A total of 15 wolves were seen in the pack by late September, bringing the fall 2015 pack count to 15 members.

**May 2016 Update:** The Iron Creek West pack numbered 14 in the spring 2016 count. 1208WF and at least 7 other wolves were seen near a new den site in May 2016.

**July 2016 Update:** The Iron Creek West pack ranges north of the Alaska Range from McKinley Bar to Highpower Creek. The pack denned at a previously unknown den site in beginning in May 2016 and in July 2016, 2 gray pups were seen with pack members.

### ***John Hansen (3 wolves)***

In March 2013, a new pack consisting of five wolves was located along the McKinley River abeam Kabena Hill. Collars were placed on the presumed dominant members of the pack, 1302GM, a two year old gray male and 1303GF a four year old gray female. Both wolves had a coat abnormality consisting of some guard hair loss, possibly follicular dysplasia (Beckmann et al, 2009) but were otherwise in good condition. The location of this pack coincided with the location of an uncollared pack of at least eight wolves that were tracked in fall 2012.

This pack may be an offshoot of the former Kantishna River pack, which once held a territory in this region prior to merging with the Somber pack in 2011. Alternatively, the pack may be a remnant or related to the former Starr Lake pack or the McKinley Slough pack. In 2013, the John Hansen pack used the same den site that the former Starr Lake pack used. Pending genetic analysis could help determine if collared members of this pack are related to any of the aforementioned packs.

**November 2015 Update:** In fall 2013, there were eight members in the John Hansen pack, which dropped down the seven confirmed members by spring 2014. In 2014, the John Hansen pack denned at a site approximately one mile northeast of the Starr Lake den site. Three pups were seen in summer 2014 and it was noted that these pups were considerably larger than the Grant Creek pups at the same time of year.

In fall 2014, the John Hansen pack consisted of eight wolves, however the composition of pups to adults was never certain. In November 2014, 1303GF was legally shot by a trapper outside the park. By spring 2015, there were five pack members and an additional male (1506GM) was collared with an accelerometer collar as part of a study in collaboration with the University of Santa Cruz. Starting in April 1506GM was occasionally apart from 1302GM with one uncollared companion. Beginning in September 2015, 1506GM was consistently in the Eagle Gorge-McKinley Bar- Turtle Hill areas with one smaller, uncollared companion (presumably a female, not a pup). As of fall 2015, 1506GM and his companion are considered a new pair, named Eagle Gorge.

1302GM and two uncollared companions continued to use territory within the former John Hansen range. There was no evidence that members of the John Hansen pack denned in 2015. The fall 2015 count for the John Hansen pack includes three wolves.

**May 2016 Update:** In February 2016, a two-year old gray male from the John Hansen pack was collared (1605GM). 1605GM was thin and the hair on his flanks and belly was thin and matted with sebum. Lice infestation is the suspected cause of the poor condition of 1605GM. Denning status for the John Hansen pack is unknown currently for 2016.

**July 2016 Update:** The two collared John Hansen males have been primarily ranging south/southeast of Lake Minchumina. One of the John Hansen males (1302 GM) was confirmed to be using the Foraker Dune Den (used by Hot Slough in 2008). Interestingly, the den used by the John Hansen pack in 2014 was also confirmed to be active this year and an uncollared gray wolf was seen at the den site. Unknown number of pups at either the Foraker Dune den or John Hansen 2014 den sites.

### ***Somber (2 wolves? Monitored infrequently)***

The Somber pack territory lies mainly between the western edge of the wilderness and park boundary along the Swift Fork. The current Somber River pack is the result of the Kantishna River and Somber packs merging in winter 2010-2011 when 0617BM, originally a member of the Kantishna River pack joined with Somber 0708GF. 0708GF died of unknown natural causes in August 2011 and 0617BM was last heard in September 2011 west of the Swift Fork. In 2012, the Somber pack denned near the Swift Fork and produced three pups, bringing the fall 2012 pack count to six wolves. In spring 2013, there were five wolves in the pack. Two collared wolves, 1109BM, a four year old male, collared in 2011 as a Somber pack member and 1210GF, a four year old female died of unknown causes in spring 2013. The mortalities were first noted in May 20, 2013. Currently there is one remaining collared pack member, yearling 1305GM.

**November 2015 update:** Pack counts for this pack are a continual challenge due to the remoteness of the pack territory which precludes frequent pack monitoring. In fall 2013, there were still five members in the Somber pack, but this decreased to two individuals in spring and fall 2014. In February 2015, it appeared from GPS data that the remaining wolf collared in the Somber pack, 1305GM, was deceased. During March 2015 capture, the collar was retrieved. It had been chewed on and old tracks of wolves were all around. The cause of mortality of 1305GM is unknown, but it is probable that he was killed by other wolves.

During capture in March 2015, tracks of the uncollared members in the pack were located and successfully back-tracked to the pack and two wolves were collared: 1510GF and 1509GM. The two newly collared wolves were accompanied by two additional wolves. By March 22, 1509GM was deceased and investigation of the carcass and site indicated that a large wolf fight occurred, resulting in the mortality of 1509GM. In fall 2015, 1510GF was located with at least four other wolves bringing the fall 2015 pack count to five wolves composed of two gray and three black wolves.

**May 2016 update:** 1510GF was seen with one other wolf, although monitoring flights were infrequent. The minimum pack count for Somber in spring 2016 is two wolves. The Somber

territory has shifted almost entirely out of the park and the pack territory and pack count were not included in the spring 2016 population and density estimate for wolves in Denali National Park and Preserve.

**July 2016 update:** Based on GPS locations, it appears that the Sombra female denned this year, outside of the western boundary of the park. No pup counts are available. Monitoring of this pack is minimal as the pack has shifted almost entirely out of the park and the pack territory and pack count were not included in the spring 2016 population and density estimate for wolves in Denali National Park and Preserve.

### ***Loner (poodle coat)***

A lone male wolf was captured and collared in March 2015 and fitted with an accelerometer collar. This wolf, 1511BM, exhibited an abnormal condition known as follicular dysplasia, also known as “poodle coat”. This condition is characterized by loss of the long guard hairs from much of the wolf’s body, resulting in a woolly appearance due to the dense, short underfur that remains. This wolf died approximately March 31, evidently due to starvation.

### ***Boot Lake (Out of study area, not monitored)***

The Boot Lake pack currently resides outside of the southwestern corner of the park and is not actively monitored. The only collared pack member is 0904GM.