

Yellowstone Wolf Project Annual Report

2015

This elk calf's defense strategy was successful. Photo - D. Stahler

Summary

There were at least 98 wolves in 10 packs (8 breeding pairs) living primarily in Yellowstone National Park (YNP) through December 2015 (figure 1). Overall, wolf numbers have fluctuated between 83-104 wolves and 6-9 breeding pairs from 2009 to 2015. Pack size in 2015 ranged from 6 to 16 (table 1) and averaged 9.7. Park-wide, 35 pups survived to year end, 21 in northern Yellowstone and 14 in the interior of the park, with an average of 4.4 per pack surviving for 8 of 10 packs with confirmed reproduction.

Wolf-Prey Relationships

Project staff detected 199 kills that were definitely, probably, or possibly made by wolves in 2015: 137 elk (69%), 14 bison (7%), 14 deer of unknown species (7% probably mule deer), seven mule deer (3.5%), three coyotes (1.5%), three moose (1.5%), three wolves (1.5%), one badger (<1%), one otter (<1%), one pronghorn (<1%), and 15 unidentified animals (7.5%). The composition of elk kills was: 28.5% calves, 6.5% yearlings, 23% adult females, 30% adult males, 3.5% adults of unknown sex, and 8.5% of unknown sex and age. Like previous years, wolf predation was monitored intensively for five months of the year – one month in early winter (mid-Novem-

ber to mid-December), one month in late winter (March), and three months in spring-summer (May-July). The type of prey killed by wolves varies by time period and consists primarily of elk. However, use of bison and mule deer appears to be increasing. This may be related to changes in availability of vulnerable prey and more scavenging of bison carcasses with their increasing abundance (figure 2).

Winter Studies

During March 2015, our “late” winter study period, a total of 36 ungulate carcasses fed on by wolves were discovered by air and ground teams. Nineteen (53%) of these ungulates were killed by wolves, including 16 elk, two moose, and one unknown species. One of the elk (6%) was a calf, three (19%) were adult females, and twelve (75%) were adult males. Wolves also fed on 17 ungulates they did not kill, 14 of which were bison. In comparison to all other previous winter studies, the proportion of carcasses acquired by wolves that they did not kill was highest during this winter study. In addition, one badger was killed by wolves.

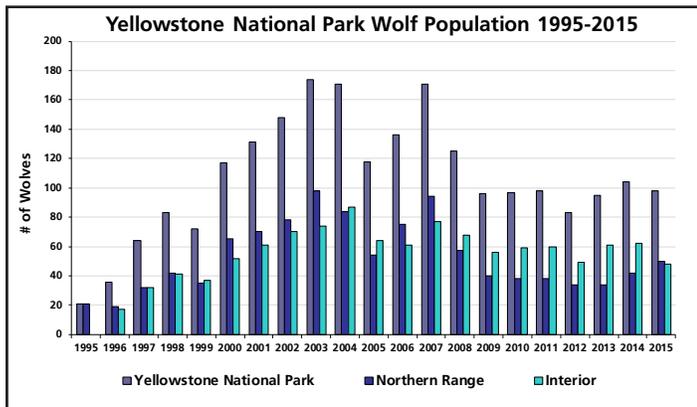
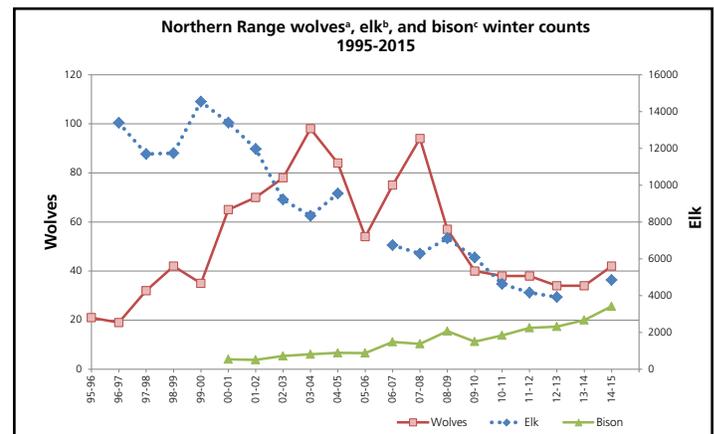


Figure 1. Yellowstone National Park early winter wolf numbers from 1995-2015.

Table 1. Yellowstone wolf population estimate as of 12/31/15.

Yellowstone Wolf Population Estimate as of 12/31/2015	Adults	Pups	Total
Northern Range			
<u>8 Mile</u>	8	5	13
<u>Junction Butte</u>	6	8	14
<u>Prospect Peak</u>	8	5	13
<u>Lamar Canyon</u>	6	3	9
loners and ephemeral groups (965M)	1		1
Northern Range Totals	29	21	50
Non-Northern Range			
<u>Wapiti Lake</u>	2	4	6
<u>Bechler (no collars)</u>	6		6
<u>Canyon</u>	4	2	6
<u>Cougar Creek</u>	5	2	7
<u>Mollie's</u>	10	6	16
<u>Snake River</u>	7		7
Non-Northern Range Totals	34	14	48
YNP Total	63	35	98
<u>underlined</u> packs count as breeding pair			



^aWolf counts are from packs living primarily inside YNP on the Northern Range.

^bOfficial elk counts were not generated in winters of '95-'96, '05-'06, and '13-'14

^cBison counts are maximum no. bison counted previous July-August for each winter during aerial counts beginning in 2000.

Figure 2. Estimated population size of wolves, elk (minimum count), and bison in northern Yellowstone National Park from 1997-2015. Gaps in data represent years where no data was collected.

During November-December 2015, our “early” winter study period, a total of 19 ungulate carcasses fed on by wolves were discovered by air and ground teams. Eighteen (95%) of these ungulates were killed by wolves, which included 14 elk, two bison, one deer, and one unknown species. Five (36%) of the elk were calves, one (7%) was a yearling, four (29%) were adult females, three (21%) were adult males, and one (7%) was of unknown age and sex. The wolves also fed on one bison that they did not kill.

Summer Predation

The other portion of the year that wolf predation is assessed is May through July. This is achieved by searching clusters (a location other than a home site where a wolf spent 30 minutes or more) generated from satellite collars (e.g., GPS collars) for prey remains by hiking to them and searching. Only some of the wolves in each pack wear GPS collars, and not all GPS collars are used to search for clusters. We found 46 suspected kills or fresh carcasses of ungulate prey, which included 30 elk, 11 deer, two bison, and three unknown species.

Mortalities

Five radio-collared wolves died in 2015 (table 2); one each was: harvested outside of the park, kicked and killed by a bull elk, killed by other wolves, died of malnutrition, and died of unexplained naturally-caused internal hemorrhaging. One wolf was an old adult (≥ 6 years old), two were adults (2-5 years old), and the other two were yearlings. In addition, wolf project staff recorded five uncollared wolf deaths: four were natural (two intraspecific, two natural unknown), and one was hit by a vehicle.

Disease

There was no evidence of any major disease mortality. Mange was still present, and by the end of the year seemed to afflict most members of the Lamar Canyon pack.

Pack Longevity

With the disappearance of the Yellowstone Delta pack in 2015, the Mollie’s pack (originally named the Crystal Creek pack) has the longest current duration of any park pack at nearly 21 years. The average pack persists for 5.8 years (n

= 41; with 10 of these packs still in existence). The shortest pack durations were only a few months. In general, packs in northern Yellowstone had shorter durations (n = 26; mean = 4.6) compared to packs living in the interior of the park (n = 15; mean = 7.8) likely due to reduced risk of inter-pack conflict, disease transmission, and human encounters (figure 3).

Wolf Capture

Nine wolves in four packs were captured and collared in 2015 (table 3). In addition to marking them, a number of measurements and biological samples were taken. Three females and six males were captured: five were adults (2-5 years old), one was a yearling, and three were pups (<12months).

Wolf Management

Wolf management activities included den site closures and several hazing events. Staff continued to manage wolf view-

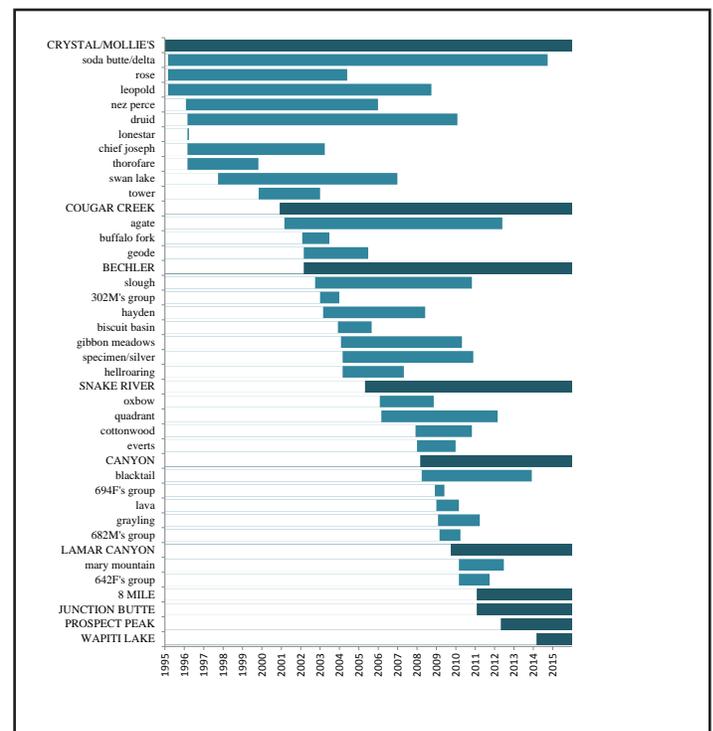


Figure 3. Lifespan of a wolf pack. Each horizontal bar is the period of time a wolf pack established and dissolved in Yellowstone National Park from 1995-2015. Packs in all capital letters are those in existence in 2015.

Table 2. Confirmed collared wolf mortalities in Yellowstone National Park in 2015.

Wolf #/Sex	Age Class	Pack	Date of Death	Cause of Death
870F	OLD ADULT	LONER	3/16/2015	Malnutrition
925M	ADULT	LAMAR CANYON	3/7/2015	Intraspecific
968F	YEARLING	UNKNOWN	11/21/2015	Harvest
979F	YEARLING	MOLLIE'S	10/28/2015	Natural Other
980M	ADULT	MOLLIE'S	8/22/2015	Interspecific (killed by bull elk)

ing areas in Slough Creek, Lamar Valley, Hayden Valley, and other areas where wolves were frequently observed.

There was no wolf hunt in Wyoming because wolves were delisted in September 2014 due to ongoing litigation. Idaho and Montana conducted wolf hunts, and one wolf (radio-collared) was legally harvested in Montana.

Wolf Pack Summaries (Figure 4)

8 Mile (13 wolves; 8 adults, 5 pups)

After the loss of their alpha male in late 2014, at least four males from the Cougar Creek pack (including 910M, 962M, and a new uncollared alpha male) joined long-time 8 Mile alpha female 909F and several of her female offspring. Even with so many new pack members, the 8 Mile pack stayed faithful to their traditional territory. The pack produced a litter of five pups in 2015, all of which survived to the end of the year.

Prospect Peak (13 wolves; 8 adults; 5 pups)

Four young males from Prospect Peak dispersed in April to the Lamar Canyon pack, leaving Prospect with only the alphas, six yearlings, and one adult female. The pack produced five pups which all survived the year. A yearling male may be taking over the alpha position as he was observed near the end of 2015 dominating SW763M, who is seven years old and has had a thrice broken and fused front leg.

Junction Butte (14 wolves; 6 adults, 8 pups)

Former alpha male 911M, with his new mate 970F, took over the dominant positions in the Junction Butte pack in early 2015. His brother 890M was relegated to the beta position. Three females bred in 2015 and produced a total of 12 pups, eight of which survived the year. The pack has continued to center their territory around Specimen Ridge, but spent more time on the Mirror Plateau than previous years, even making a trip down to Pelican Valley—home of the alpha female’s natal pack, the Mollie’s.

Table 3. Wolves captured and handled in 2015.

Capture Date	Wolf #/Sex	Age	Color	Pack
1/29/2015	978F	Adult	Gray	Mollie’s
1/29/2015	979F	Pup	Black	Mollie’s
1/29/2015	980M	Adult	Gray	Mollie’s
12/12/2015	890M	Adult	Black	Junction Butte
12/12/2015	992M	Adult	Black	Lamar Canyon
12/12/2015	993M	Adult	Black	Lamar Canyon
12/12/2015	994M	Pup	Gray	Junction Butte
12/12/2015	995F	Yearling	Gray	Junction Butte
12/12/2015	996M	Pup	Black	Prospect Peak

Lamar Canyon (9 wolves; 6 adults, 3 pups)

In early 2015, alpha male 925M was killed by the Prospect Peak pack; and several weeks later four members of Prospect joined pregnant 926F to raise the pack’s five pups. Three of the pups survived, but by the end of 2015 many of the pack members had varying degrees of mange infection.

Mollie’s (16 wolves; 10 adults, 6 pups)

In August, alpha male 980M was kicked by a bull elk while the pack was hunting and died from his injuries. This left alpha female 779F with six pups from 2015 and nine of her yearling and two year-old offspring. By the end of the year the pack still did not have a clear alpha male, echoing their situation from the winter of 2011-2012. With the disintegration of the Yellowstone Delta pack, the Mollie’s are the only remaining reintroduced pack (originally called the Crystal Creek pack and released in 1995).

Wapiti Lake (6 wolves; 2 adults, 4 pups)

This pair took over the former Canyon pack territory in Hayden Valley, perhaps because the 4-5 year old dominant female was born into the Canyon pack. Several young Canyon dispersers spent time with this pair and their four pups during the summer, but by the end of the year the pack was back to two adults and four pups.

Canyon (6 wolves; 4 adults, 2 pups)

Perhaps due to pressure from the newly-formed Wapiti Lake pack, the Canyon pack left their traditional summer territory and moved closer to the Old Faithful geyser basin. The white alpha female localized near an old den, and we confirmed the pack had at least two pups when they were observed in late October. The pack travelled widely at the end of 2015 and tracking became difficult when alpha 712M’s collar battery ran out.

Cougar Creek (7 wolves; 5 adults, 2 pups)

Long-time alpha female, and oldest recorded wolf in Yellowstone, 478F, died in November at 12.6 years old. The pack produced at least two pups in 2015 and ended the year with at least five adults. Tracking this pack has been challenging because they travel widely and their territory includes thick lodgepole pine regrowth, making it difficult to observe them even when radio signals are located.

Snake River (estimated at 7 wolves, likely all adults)

It is unknown if the Snake River pack denned or successfully raised pups this year. The pack spent more time in the Yellowstone Delta and Thorofare areas, indicating they have taken over that territory from the now-defunct Yellowstone Delta pack.

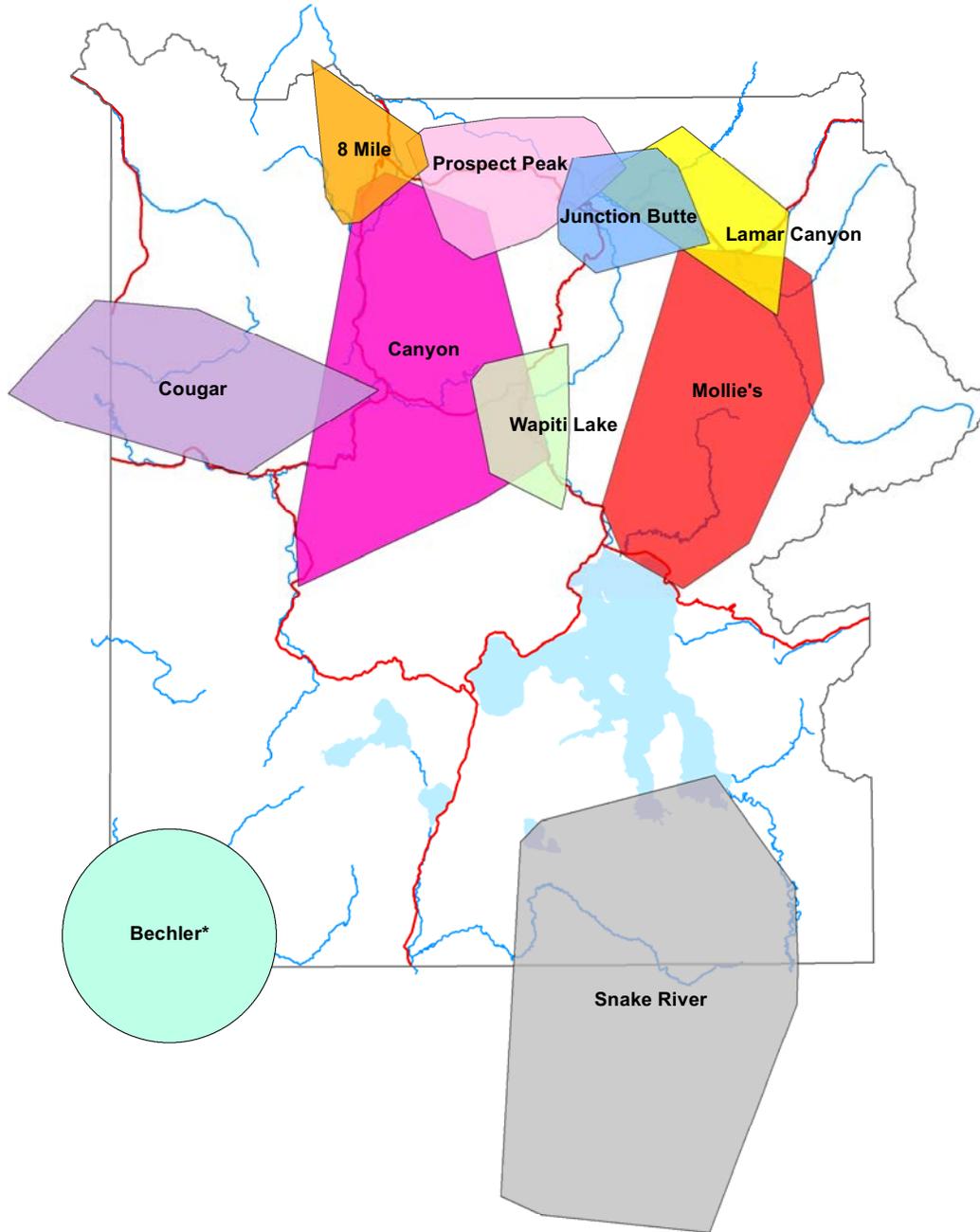
Bechler (estimated at 6 wolves, unknown ages)

With no radio-collars in this pack, we rely on visitors and park staff reporting sightings, and cases of howling and wolf tracks in the Bechler region. Reports were sparse in 2015, offering little information on pack size or reproduction. As a result, pack size was estimated.

Other wolves

Lone gray 965M began 2015 with the Prospect Peak pack and then dispersed with his male siblings to the Lamar Canyon pack. He was the lowest ranking male in the pack and by the end of the year had dispersed again, this time travelling alone.

2015 Yellowstone Wolf Pack Territories



* No radio collars present, unable to estimate territory size.

Figure 4. Territories of wolf packs that primarily used Yellowstone National Park in 2015. Territories only reflect NPS monitoring. The circular areas indicate that this pack had no radio collars.

Publications

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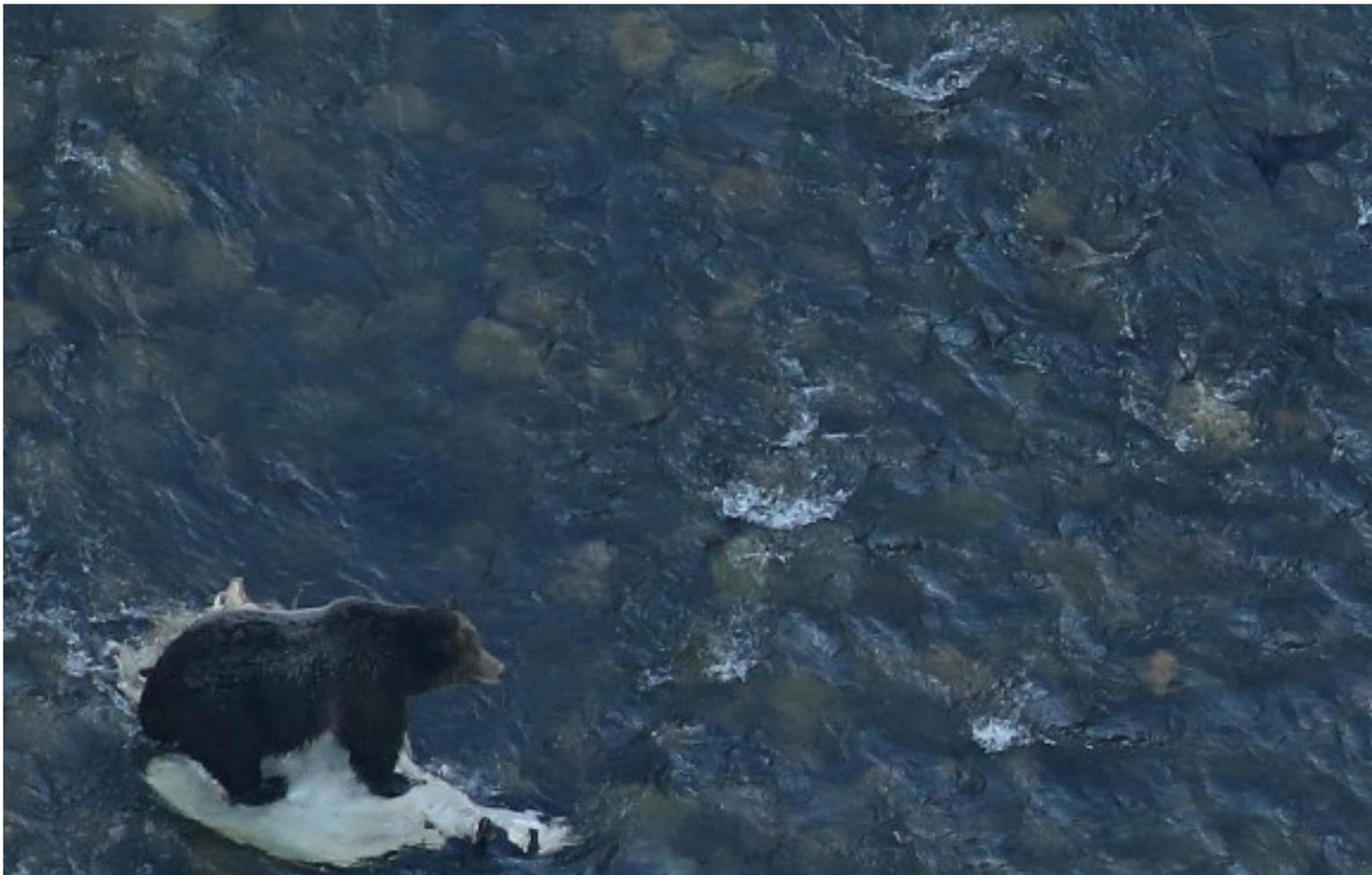
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Ubani, A., J.A. Vucetich, D.R. Stahler, and D.W. Smith. 2015. Interannual variability: a crucial component of space use at the territory level. *Ecology* 96:62-70.



Outreach

Public outreach included giving 285 formal talks, participating in 94 interviews, helping 19,000 people view wolves, making 16,780 visitor contacts, and giving 573 informal talks in the field. Volunteers (table 4) worked over 13,000 hours in 2015.

Table 4. Wolf Project Volunteers, 2015

NAME	Dates worked	Total hours
Ellen Beller	3/16/2015-4/4/2015	160
Wes Binder	3/16/2015-4/7/2015	184
	11/12/2015-12/18/2015	296
Ellen Brandell	5/20/2015-8/30/2015	824
Lizzie Cato	1/23/2015-4/6/2015	592
Nels Christianson	2/26/2015-4/6/2015	320
Elizabeth Dowling	2/26/2015-4/6/2015	320
	11/12/2015-12/18/2015	296
Genivieve Fuller	2/26/2015-4/6/2015	320
Henriette Gelink	5/4/2015-7/17/2015	600
Grace Glynn	2/26/2015-4/6/2015	320
	11/12/2015-12/18/2015	296
Emily Harrington	11/12/2015-12/18/2015	75
Sarah Hardee-Peterson	7/2/2015-7/19/2015	144
Mark Hebblewhite	11/12/2015-12/18/2015	75

NAME	Dates worked	Total hours
Ellen Beller	3/16/2015-4/4/2015	160
Wes Binder	3/16/2015-4/7/2015	184
	11/12/2015-12/18/2015	296
Ky Koitzsch	2/26/2015 - 3/31/2015	320
Lisa Koitzsch	1/15/2015-3/31/2015	608
Nels Christianson	5/4/2015-5/22/2015	152
Elizabeth Dowling	11/12/2015-12/18/2015	296
Hannah Lodberg-Holm	5/4/2015-7/17/2015	600
Emil McCain	2/26/2015-4/6/2015	320
Henriette Gelink	11/12/2015-12/18/2015	296
Aaron Morris	3/16/2015-4/1/2015	136
Anna Nisi	2/26/2015-4/6/2015	320
Mike Peterson	7/2/2015-7/19/2015	144
Kira Powell	3/16/2015-3/25/2015	80
Mark Hebblewhite	11/12/2015-12/18/2015	296
Jessie Roughgarden		320
Coulter Schmitz	5/2/2015-8/3/2015	752
Rena Schweizer	11/12/2015-12/18/2015	296
Brian Seneker	3/7/2015-3/15/2015	72
Jane Sheffer	2/26/2015-4/6/2015	320
Carolyn Shores	11/12/2015-12/18/2015	296
Jeremy Sunderaj	6/3/2015-8/5/2015	104
Kim Szcodronski	2/26/2015-4/6/2015	320
Rory Trimbo	11/12/2015-12/18/2015	296
Shane White	11/12/2015-12/18/2015	296
TOTAL:		13,086

On a frozen bison in the Lamar River, a grizzly bear protects its find from the Junction pack on shore. (NPS Photo - D. Stahler)



For a complete list of our publications, please visit: go.nps.gov/yellwolves



The 8-Mile Pack pups in mid summer. (NPS Photo - E. Stahler)

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