

# 2015-16 Annual Report



## Gallatin National Forest AVALANCHE CENTER



**GRIZZLY OUTFITTERS  
BRIDGER BOWL  
YC COMMUNITY FOUNDATION  
YELLOWSTONE ARCTIC YAMAHA**

**Cooke City Motorsports  
Mystery Ranch  
Spark R&D  
Montana Ale Works  
Community Food Coop  
Spark 1  
Cooke City Super 8  
Mountain Valley Motorsports of Cody**

Alpine Orthopedics  
Javaman  
Buck Products  
Gallatin Valley Snowmobile Association  
World Boards  
Bountiful Table  
Lone Peak Brewery

Katabatic Brewing Co.  
Ticket River  
ISMA  
Montana Telemark Corporation  
Soda Butte Lodge  
Gallatin County SAR  
Yamaha Motor Corp.

**Report by: Doug Chabot, Eric Knoff, Alex Marienthal**

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*Cover : A snowmobiler triggered avalanche in Tepee Basin.*



# 2015-16 Annual Report Gallatin National Forest Avalanche Center

APRIL 2016

## Season Summary

The Gallatin National Forest Avalanche Center just wrapped up 26 years of operation. We started the season with the threat of a dry El Nino winter which never materialized and finished with a snowpack measuring close to 100% average. March got almost as much snow as January and February combined.



The first avalanche advisory was issued November 4<sup>th</sup>. The next day, two hunters were caught in an avalanche in the Bridger Range, the season’s first human triggered slide. Daily avalanche advisories started on December 5<sup>th</sup> and ended on April 10<sup>th</sup>, a total of 138 reports. Our mountains were plagued by a weak, unstable snowpack the first half of the season. An Avalanche Warning on December 19<sup>th</sup> coincided with a snowmobiler getting caught and killed in an avalanche on Sheep Mountain outside Cooke City. Tragedy struck again one month later when a skier was killed in a slide near Cedar Mountain on January 19<sup>th</sup>. Nationally, there have been 27 avalanche fatalities: 17 non-motorized and 10 motorized.

The avalanche danger rose and fell with snowstorms. Our busy season was especially demanding in December and January when the danger was high, the snowpack tricky and our teaching load heaviest. During this time we leaned on our volunteers, both observers and field partners, along with the professional educators at the Friends of the Avalanche Center. We could not do our job without their help and we are very thankful for their support.

## GNFAC Index

- Number of people who receive our daily avalanche advisories: 4,523
- Total number of avalanche classes and attendees: 99 and 4,729
  - Number of kids: 941
  - Number of snowmobile classes and riders: 31 and 845
- Number of YouTube videos and views this year: 77 and 100,000+
- Reported avalanche incidents: 72
  - Number of people caught, buried and killed: 16, 2 and 2
- Number of Facebook, Instagram and Twitter followers: 5,502, 3,256 and 1,700
- Number of media interviews: 60
- Number of times Doug Chabot forgot his avalanche transceiver on a field day: 1
  - Witnesses: 1
- The number of times Alex Marienthal got the snowmobile stuck: too many to count
  - Number of times he got bucked off into the mud: 1
- Witnessed times Eric Knoff double heel ejected on a green, beginner ski run: 1
  - Distance his skis traveled before hitting trees: 100’.

### Inside this issue:

<i>Advisories / Incidents</i>	4
<i>Education / Finances</i>	5
<i>Friends of Avalanche</i>	7
<i>Finances</i>	7
<i>Snowpack Summary</i>	10
<i>Graphs, Charts, Tables</i>	12
<i>Letters of Support</i>	19

## *Avalanche Advisories*

The daily avalanche advisories are the cornerstone of our work at the GNFA. Every morning all winter long one of us unlocks the door and turns on the lights at 4 a.m. The goal is to have the advisory posted by 7:30 a.m. in time for people heading out the door. Most people get our advisories by email or on our web site. More and more people are reading it on a smartphone and we will continue to work on making that experience better as technology advances. We are one of the few centers with both an Android and iOS app for our advisories. 54% of people accessing the advisory page do so on their smartphone with 44% from a desktop. Out of the mobile devices, 64% are iPhone or iPad and 36% Android, a 4% shift away from iPhone to Android compared to last year.

Contrary to the myth that the younger generation won't read and need to be fed soundbites and icons to keep their interest, we are happy to report that people *actually read* our advisories. Google Analytics shows folks averaging 2:49 on the advisory page, about as long as it takes us to record it.

## *YouTube*

Making videos about the snowpack has become a staple of our field days. Simple and usually less than two minutes in length, we have been successful using this platform to teach people about the snowpack. If people only watched our videos and never read the advisory they would get enough information to make good decisions in the backcountry. Our videos are part of the "show and tell" package of information we provide in the daily advisories. This season we made 77 videos that were viewed over 100,000 times. Since we made our first video in 2006 we have a library of 472 videos viewed 1.3 million times.

THIS WINTER  
4,523 PEOPLE A  
DAY ACCESSED  
OUR AVALANCHE  
ADVISORY.

## *Facebook, Twitter and Instagram*

Social media is a godsend. We reach countless more people through Facebook, Twitter and Instagram than we ever dreamed possible. We post our advisories every morning and give updates many afternoons, both of which drive people to our website. Facebook dominates and we currently have 5,502 "Likes", 1,500 more than last season. Our Twitter account has 1,700 followers while Instagram has 3,256 followers, more than double last year.

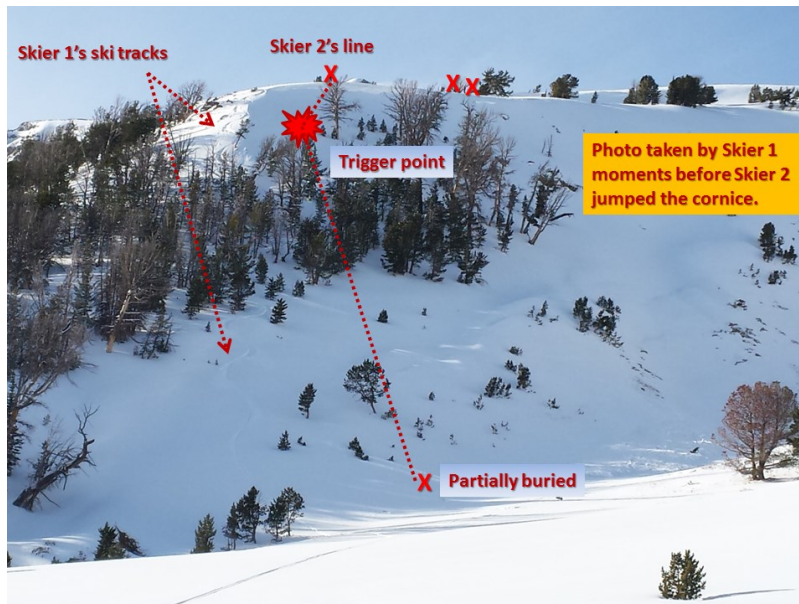
## *Media*

Traditional print and television media remain an important part of getting avalanche information out to the public, especially during dangerous times. This season we had 60 interviews with print and television media.

## *Avalanche Incidents*

An *avalanche incident* is defined as someone triggering an avalanche unintentionally. This season 72 incidents were reported to us, involving two deaths. The complete list is on page 14.





Over the last ten years Montana is ranked second in the nation in avalanche fatalities (38) and first in snowmobiler avalanche fatalities (17). We are not happy with this ranking and continue to increase our education offerings to reduce these numbers. Pages 12 and 13 have graphs showing the last 10 years of avalanche incidents grouped by activity and state.

## *Avalanche Education*

The GNFAC and Friends of the Avalanche Center work in tandem to provide avalanche education to the public. Our goal is to accommodate all requests no matter the age or user group. Skiers, snowboarders, snowmobilers, snowshoers, climbers, and motorized snow bikers are all welcome. Alex Marienthal and Chris Bilbrey did the heavy lifting required to organize all these courses. They also taught alongside Mark Greeno, Nina Hance, Adam Norlander and Quint Gidley, our four busiest instructors.

Our avalanche education programs reach many 7<sup>th</sup>-8<sup>th</sup> graders and high schools in Bozeman, Big Sky, Livingston, and Belgrade. Young adults are a prime target of our education efforts since ski area sidecountry use is exploding. This year we educated 931 kids, a record number, and continued a very successful program at the Bozeman High School involving a newly formed backcountry ski club. We also spoke at the entire Big Sky High School and are working with the administration to set up a similar program there. We lecture to ski patrols, Big Sky and Gallatin County Search and Rescue groups, local snowmobile clubs, MSU, ski and outdoor stores in Bozeman and Big Sky. We do not turn away any group requesting avalanche education. We have taught in Bozeman, Big Sky, West Yellowstone, Ennis, Dillon, Livingston, Gardiner, Cooke City, Billings, Big Timber, Helena, and Great Falls.



WE TAUGHT 99  
CLASSES TO 4,729  
PEOPLE. THIS  
INCLUDES 941 KIDS  
AND 845  
SNOWMOBILERS.



48% OF OUR ANNUAL BUDGET COMES FROM THE FRIENDS OF THE AVALANCHE CENTER AND MONTANA FISH, WILDLIFE AND PARKS.

Our three main education offerings are:

1. *1-hour Avalanche Awareness* lecture. This class is a starting point for people to learn about avalanches. We have specific talks for each user group that cover Terrain, Weather, Snowpack and Decision-making.
  2. *Avalanche Awareness Class with Field Session*. These classes consist of 5 hours of lectures, usually over two evenings, with an all-day field session. We offer them for skiers/ snowboarders and a separate one for snowmobilers.
  3. *Companion Rescue*. This is the third year we offered this popular class. It is a six-hour field based course that concentrates on avalanche rescue. We ran classes outside Bridger Bowl, in Beehive Basin near Big Sky and outside Cooke City.
- This year we purchased a portable “Beacon Park” which we used in classes. It allowed us to teach groups of kids and adults about avalanche beacons in areas without snow (gyms, grassy field, etc.).

This April we hosted the 7<sup>th</sup> *Professional Development Workshop for Avalanche Professionals*. The topic for the day was Weather Forecasting and we had six speakers talk about weather, weather instruments and weather forecasting. Forty-five professionals attended from Montana, Idaho and Wyoming. The lectures were filmed and are posted on our YouTube channel for everyone to watch.



## *Finances of the GNFAC*

The CGNF provides the Avalanche Center with 52% of its funding which covers salaries, benefits, travel, vehicles, computers office space . We rely on other sources for the shortfall, namely our long-term supporters, Friends of the Avalanche Center (35%) and Montana FW&P (13%).

## *Friends of the Avalanche Center*

The Friends of the Avalanche Center is a nonprofit organization whose mission is to financially support the work of the Avalanche Center. The Friends cover expenses related to the avalanche education program, as well as administrative, snowmobile, weather station and website costs.

The Friends were founded in 1992 and have donated over \$476,000 to the operation of the GNFAC. This year their total contribution was \$69,878. Almost all the monies came from local businesses and individuals in southwest Montana with the following being long term, recurring support:

- 17<sup>th</sup> Annual Powder Blast
- Yellowstone Club Community Foundation
- 14<sup>th</sup> Annual King and Queen of the Ridge at Bridger Bowl
- 8<sup>th</sup> Annual Avalanche Social at Montana Ale Works

THE FRIENDS HAVE  
DONATED OVER  
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THEIR INCEPTION  
IN 1992.



The Board of Directors represents a varied slice of the winter recreating community. They are a volunteer board with two part-time staff, the Education Coordinator (Chris Bilbrey) and Treasurer (Allyson Fauver), both paid hourly. They are a lean, effective and backcountry savvy group led by Board President Jeannie Wall. They include: Emily Stifler-Wolfe (Secretary), Laura Ryan , Ben Nobel, Tyler Allen, Ben Zavora, Mark Greeno and Dawn Brown.



## *Donated Labor and Equipment*

The Avalanche Center would not be able to operate at its current level without the local community donating time, expertise and equipment. When it's all added up their donated work totals \$33,800. These donations reflect a dollar estimate of what it would cost to hire people or buy/rent equipment.

### **Field Volunteers/Observers**

It's not possible for the three of us to always go in the field with each other so we rely on a team of skilled volunteers to be our partners. Volunteers donated 53 field days to the GNFAC. These folks are

our peers with many being professional snow workers. We also count on folks emailing their personal field observations, stability test results and snowpits. The accuracy of our forecasts is a direct reflection of their detailed and steady reports. We owe a special thanks to Big Sky and Bridger Bowl ski patrols for their daily observations.



### **Yellowstone Arctic Yamaha and Yamaha Corporation**

Jason and Bill Howell, owners of Yellowstone Arctic Yamaha in West Yellowstone, loaned us two sleds this year. Working with Craig Gagne of Yamaha Corporation, they had us riding 2016 Vipers. A large part of our job requires field work on snowmobiles and we could not do our jobs without their dedication and generosity.

#### VOLUNTEER LABOR( billed at \$15/hour):

NRCS	\$3,600
Big Sky Ski Area (~175 hours)	\$2,625
Bridger Bowl Ski Area (~130 hours)	\$1,950
Yellowstone Club (~130 hours)	\$1,950
National Weather Service (121 hours)	\$1,815
Volunteer observers (~500 hours)	\$7,500
Field volunteers (424 hours)	\$6,360

#### EQUIPMENT RENTAL (Contributed):

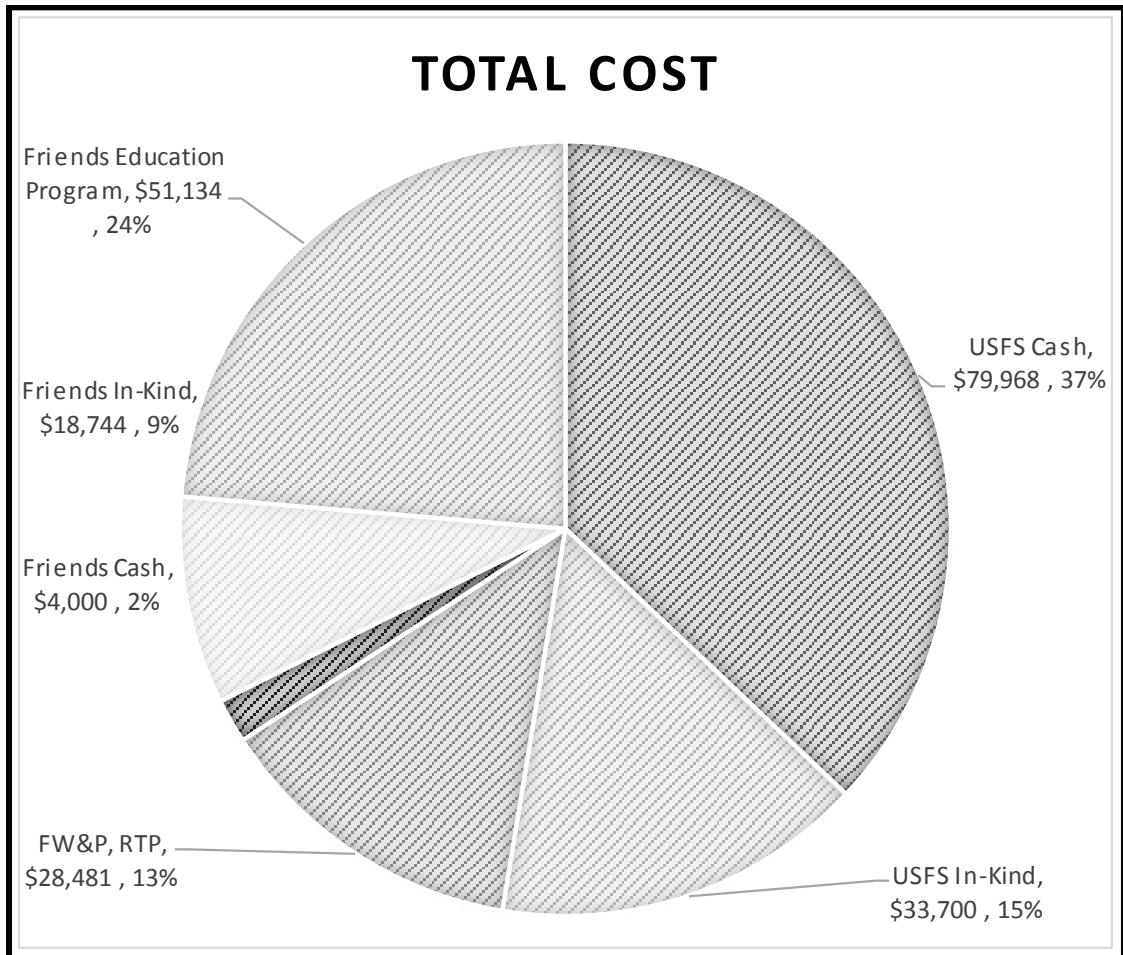
Yellowstone Arctic Yamaha (two sleds loaned):	\$8,000
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<b>TOTAL</b>	<b>\$33,800</b>
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*Total Costs*

Custer Gallatin National Forest (salaries/benefits)	\$79,968
◆ CGNF In-Kind (vehicles, office, etc)	\$33,700
Montana FW&P Rec Trails Program (salaries)	\$28,481
Friends of the Avalanche Center (education program)	\$51,134
◆ FOAC In-Kind	\$18,744
◆ FOAC Cash	\$4,000
<hr/>	
<b>Total Costs</b>	<b>\$216,027 (100%)</b>
<i>CGNF Contribution</i>	<i>\$113,668 (52%)</i>
<i>Outside Contributions (non federal government)</i>	<i>\$102,359 (48%)</i>





## Snowpack and Weather Summary

It was another busy season for the GNFAC with Doug, Eric and Alex issuing 138 daily advisories resulting in 230,000 visits to the website. The average duration of each visit was nearly two minutes. The GNFAC also made 77 videos over the course of the winter receiving over 100,000 views on Youtube and the Friends of the GNFAC taught 99 avalanche education classes to 4,729 people. The GNFAC also did 60 interviews with various media outlets around the Bozeman area.

A big change to the GNFAC this season was the replacement of long time forecaster Mark Staples with new forecaster Alex Marienthal who has a master's degree in snow science from MSU and five years of ski patrol experience at Bridger Bowl. Alex is also education coordinator for the Friends of the Avalanche Center, a near full time job in itself. He did an excellent job managing a high level of responsibility while learning the involved process of avalanche forecasting.

The winter of 2015-16 snowfall exceeded most expectations. By April 1<sup>st</sup> the snowpack around southwest Montana was near 100% of normal. This was a surprise to most as the infamous El Nino had many predicting another below average season. During the fall, talk of El Nino prompted a high number of pray for snow parties in which a huge number of skis and boards were burned. These sacrifices were ignored by Ullr through October and November. By Thanksgiving, the mountains of southwest Montana had 1.5 to 2 feet of snow and most people feared the worst.

The dread of El Nino was exacerbated by a cold, dry spell during the first week of December. This cold snap faceted the thin snow cover and produced a well-developed layer of depth hoar. By the 7<sup>th</sup> of December two feet of faceted snow existed in the hills of southwest Montana. Backcountry skiers and riders braced for unstable conditions which



became reality on the 8<sup>th</sup> of December when the first large storm impacted the area. This storm favored the mountains around Cooke City and West Yellowstone with well over a foot of snow totaling more than 1" of SWE.

While heavy snow was a welcomed change, the GNFAC issued its first avalanche warning on December 8<sup>th</sup>. Heavy snow continued and the Avalanche Center issued five more warnings in the following ten days. Sadly, the first fatality happened on December 19<sup>th</sup> when a snowmobiler was killed in an avalanche outside Cooke City during an avalanche warning. Natural and human triggered avalanches occurred for ten days straight following the fatality. December proved to be a snowy month with most mountain locations receiving 5-7 inches of SWE.

December's heavy snows proved to be a blessing and a curse as snow quality improved but stability remained poor. High pressure set in during this first week of January and snow returned the second week of the month, once again bumping up the avalanche danger. The depth hoar that formed in early December remained the primary layer of concern and continued to produce avalanches. On the 19<sup>th</sup> of January a second fatality occurred when a skier died in an avalanche on Cedar Mountain in the Northern Madison Range. The victim was a pro patroller from the Yellowstone Club with six years of patrolling experience. This accident caught everyone off guard and was a heavy blow to the skiing community.

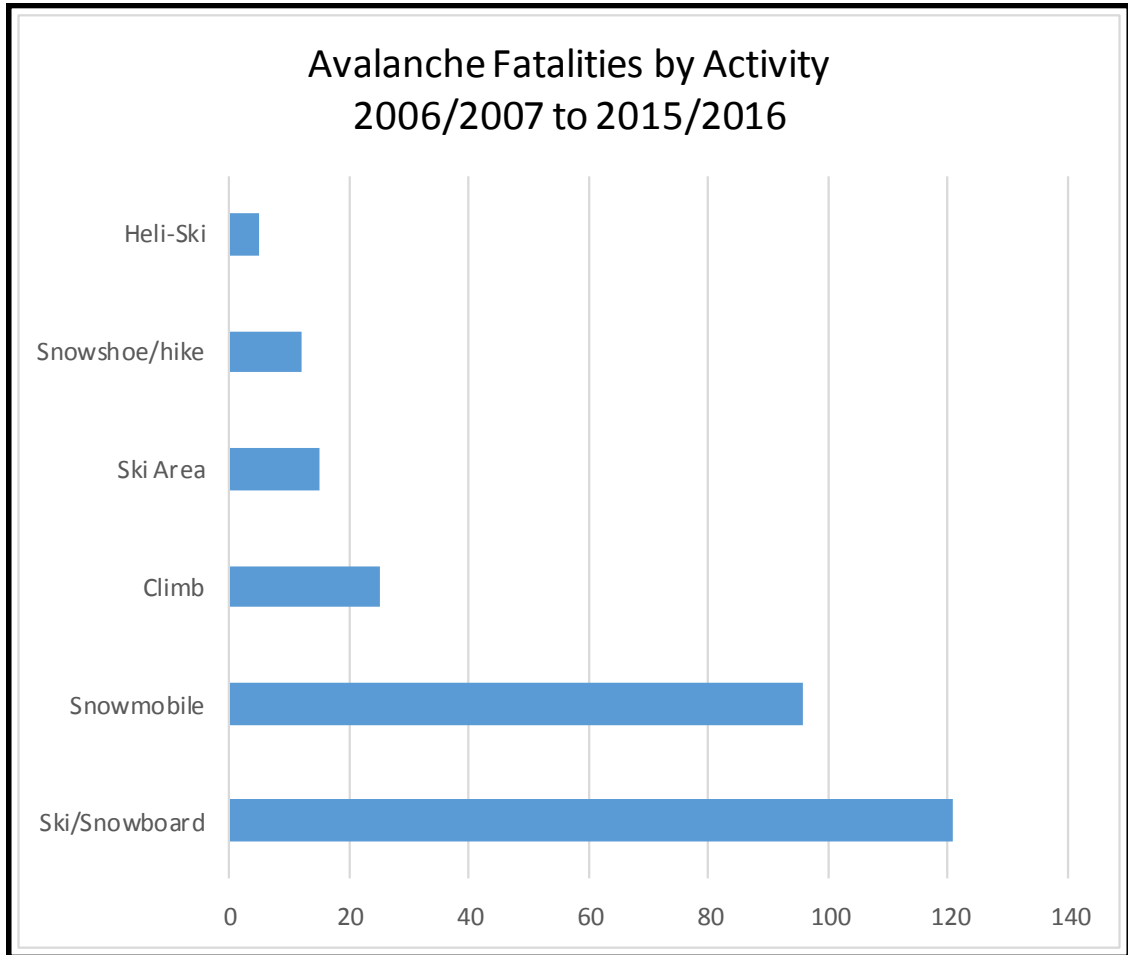
February began with light to Moderate snowfall followed by a week a high pressure from the 4<sup>th</sup> through the 11<sup>th</sup>. Temps during this time were above average, which helped the depth hoar layer gradually gain strength. However, this high pressure period formed a well-developed layer of surface hoar which was capped by subsequent storms from the 14<sup>th</sup> through the 20<sup>th</sup>. This new buried weak layer produced multiple natural and human triggered slides over the next few weeks, fortunately without incident.

By the beginning of March, the buried surface hoar layer had become less reactive. This was helpful since the big faucet in the sky once again turned on. Most Snotel sites in southwest Montana recorded between 4-6 inches of SWE during March. The snowpack handled the new snow well and very few avalanches were reported during the last two weeks of March. During this time, both snow quality and stability were good, producing superb backcountry skiing and riding.

For better or worse, snow shut off in April when warm, dry conditions returned. The snowpack held together during the initial warm up, but strength and stability gradually deteriorated as above freezing temperatures took their toll. By the second week of the month, large wet snow avalanches were occurring across the advisory area and access was becoming difficult. This combination quickly reduced backcountry numbers. This prompted the GNFAC to issue the last daily advisory on the 10<sup>th</sup> of April.

### Avalanche Incident Graphs: 10 Years

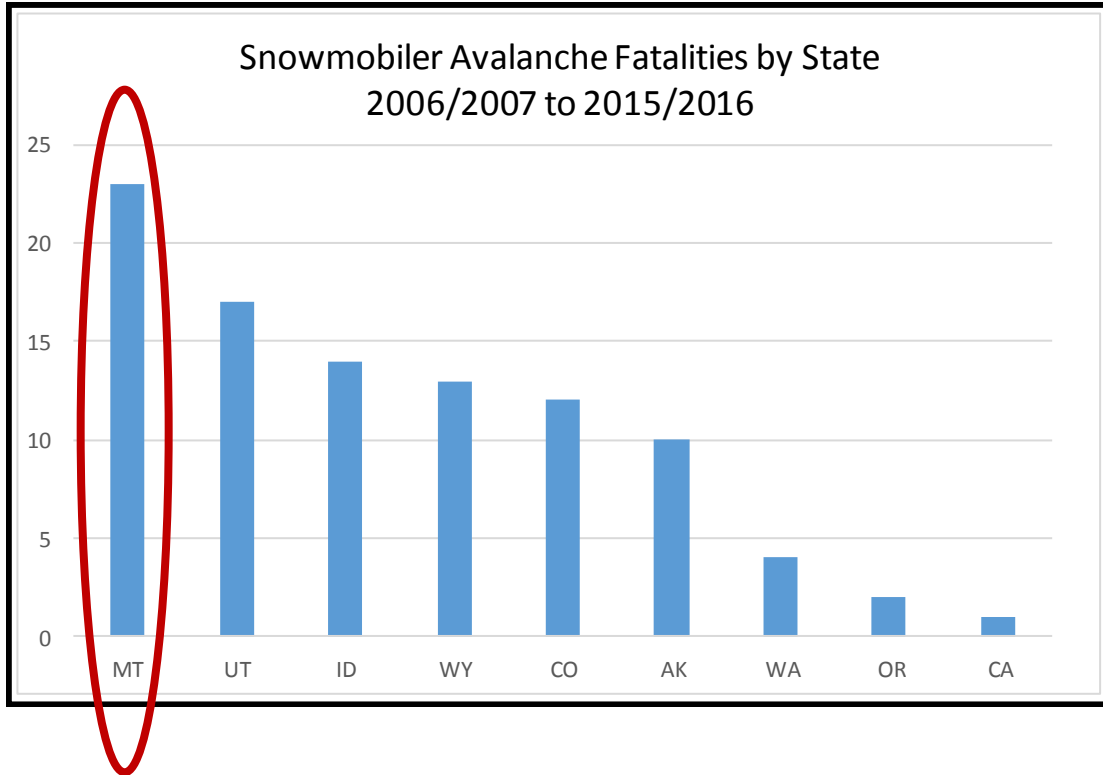
**Graph 1: NATIONALLY, 10 years of Incidents by Activity**



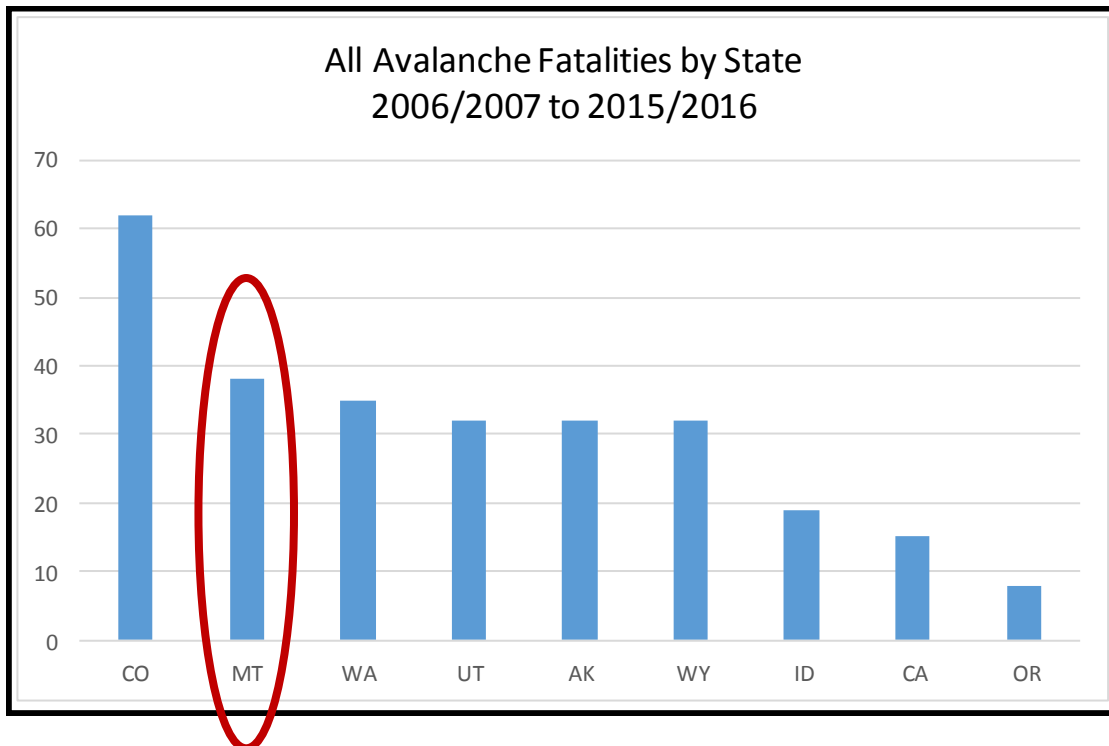




**Graph 2**



**Graph 3**



## Avalanche Incidents Table

**72 Incidents resulting in 2 burials and 2 deaths**

DATE	LOCATION	DETAILS
11/5/2015	Bridger Range - N of Sacajewea Peak	2 hunters triggered, caught, not buried.
11/7/2015	Absorka Range - Emigrant Peak	1 skier, briefly caught, skied off slab, not injured
12/4/2015	S. Gallatin - Sepulcher Mtn	1 skier triggered, not caught (small pocket of wind slab)
12/9/2015	Cooke City - Mt. Abundance	1 snowmobiler triggered (small)
12/15/2015	Cooke City - Miller Drainage	2 snowmobiler triggered, caught, not buried
12/16/2015	S. Madison - Cabin Creek	1 snowmobiler triggered (remote), not caught.
12/17/2015	N. Gallatin - Mt. Ellis	1 skier triggered (remote), not caught.
12/18/2015	N. Madison - Buck Creek	1 snowmobiler triggered, not caught
12/19/2015	S. Madison - Carrot Basin	1 skier trigger (remote), not caught
12/19/2015	Cooke City - Sheep Mountain	3 snowmobilers caught, 1 partial burial, 2 full burials, 1 fatality
12/20/2015	N. Madison - Jack Creek	1 snowmobiler - 1 remote trigger
12/21/2015	N. Madison - 3rd Yellowmule	1 Snowmobile triggered - not caught
12/26/2015	Cooke City near Daisy Pass	2 snowmobile triggered. 1 caught buried sled. Rider not buried.
12/28/2015	Cooke City - Henderson Mountain	1 snowmobiler triggered, not caught
12/30/2015	Cooke City - Lulu Pass	1 snowmobiler triggered, not caught
12/30/2015	Cooke City - Mt. Abundance	1 snowmobiler triggered, not caught
12/31/2015	Cooke City - Sheep Creek	1 snowmobiler triggered, not caught
12/31/2015	Cooke City - Chimney Rock	1 snowmobiler triggered, not caught
12/31/2015	N. Gallatin - Storm Castle	1 skier triggered, not caught
1/8/2016	S. Madison - Tepee Basin	1 snowmobiler triggered, caught, not buried
1/14/2016	Bridger Range - Football Field	1 skier triggered, not caught
1/17/2016	Bridger Range - Wolverine Bowl	1 skier triggered, caught, partially buried (sluff)
1/17/2016	Cooke City - Lulu Pass	1 skier triggered, not caught
1/17/2016	N. Madison - Beehive Basin	1 skier triggered (small)
1/18/2016	Bridger Range - Ramp area	1 skier triggered (small 20' wide)
1/19/2016	Bridger Range - Frazier Basin	1 skier triggered, not caught
1/19/2016	N. Madison - Cedar Basin	1 skier caught, killed from trauma
1/21/2016	Bridger Range - Truman Gulch	2 caught hiking up, not buried (1 skier, 1 snowboarder)
1/21/2016	S. Madison - Cabin Creek	1 snowmobiler triggered
1/22/2016	N. Madison - 3rd Yellowmule	1 snowmobiler triggered
1/23/2016	Bridger Range - Baldy Peak	1 skier triggered avalanche from cornice (ACu)



2/1/2016	Lionhead	1 snowmobiler triggered, not caught
2/1/2016	Cooke City	1 skier triggered, not caught (small: 35' wide)
2/1/2016	N. Bridgers - Frazier Basin	1 skier triggered, not caught
2/7/2016	Cooke City	1 skier triggered, not caught
2/14/2016	S. Madison - Taylor Fork	1 snowmobiler triggered slide
2/15/2016	Cooke City - Miller Ridge	1 skier remotely triggered
2/17/2016	Cooke City	2 snowbiker triggered slides Cooke City; (small)
2/18/2016	Cooke City - Round Lake	2 snowmobiler triggered slide, 1 caught, not buried
2/17/2016	Cooke City- Top of the World	1 snowmobile triggered slide, not caught
2/19/2016	Cooke City - Goose Ck.	1 skier Remote or cornice trigger, (large)
2/19/2016	Lionhead - Black Bear	1 snowmobiler triggered, caught
2/20/2016	Cooke City - Mt. Abundance	1 snowmobile triggered, not caught
2/21/2016	S. Madison - Cabin Creek	1 snowmobile triggered, not caught
2/22/2016	Lionhead	1 snowmobile triggered, not caught
2/21/2016	Cooke City	Guessing at least 10 skier/snowmo triggered on 2/21 and 2/22: Goose Creek 4, Scotch Bonnet 2, Wolverine 1,
2/22/2016	Cooke City	"
2/25/2016	S. Madison - Cabin Creek	1 snowmobiler triggered, not caught, buried sled
3/5/2016	Cooke City - Rasta Chutes	1 skier Triggered, caught, dog caught, not buried
3/12/2016	Lionhead	1 snowmobiler triggered
3/15/2016	N. Madison - Beehive Basin	1 skier triggered 2 small avalanches, not caught
3/26/2016	Near Gardiner	1 skier fell off cornice and triggered slope below, caught
3/26/2016	Cooke City - Goose Ck.	1 snowmobile triggered, small and deep, not caught

*Avalanche Education (next 3 pages)*

**TOTAL: 4,729 (941 kids <18 y.o.; 845 snowmobilers)**

Date	Instructor	Group/Topic	Total
9/18/2015	Marienthal	Awareness & Rescue at Lewis and Clark SAR	12
10/6/2015	Chabot	MSU Outdoor Rec / Snowpack observations and Leadership	12
10/22/2015	Marienthal	Awareness @ Northwestern Energy in Butte	50
10/29/2015	Bilbrey/Olson	Awareness @ REI	37
10/26/2015	Chabot	Snowpits, stability tests @ National Ava School,	125
11/11/2015	Chabot/Knoff/	Stability tests/Sidecountry/Incidents @ MSU SAW	430
11/14/2015	Gidley	Snowmobile awareess @ WYSAW	75
11/15/2015	Hance	Awareness @ REI for employees	15
11/16/2015	Greeno	Awareness @ Livingston HS	176
11/17/2015	Marienthal/Greeno	Sidecountry @ BHS	30
11/17/2015	Bilbrey	Awareness @ Basecamp, Billings	67
11/18/2015	Olson	Awareness @ Grizzly Outfitters, Big Sky	32
11/18/2015	Hance	Awareness @ Roskie, MSU	28
11/19/2015	Hance	Awareness @ Sleeping Giant MS	130
11/19/2015	Olson	Awareness @ Big Timber	22
11/20/2015	Marienthal/Knoff/ Birkeland	Deep slabs/ Stability tests - Patrol Snow Safety Day @ Bridger	175
11/20/2015	Greeno	Awareness @ Anderson School	51
11/23/2015	Chabot	Last season Recap/ Gallatin County SAR	36
12/1/2015	Greeno/Kavanaugh	Kavanaugh awareness @ Library	15
12/2/2015	Birkeland/Hendrikx	ASMSU Basic w/ Field Day	170
12/3/2015	Knoff/Marienthal	ASMSU Basic w/ Field Day	170
12/3/2015	Gidley	Awareness for Snowmobilers @ Hi-Tech in	110
12/3/2015	Nobel/Steckmest	Beacon training for NPS	8
12/4/2015	Knoff	Yellowstone Club Ski Patrol Training	30
12/5/2015	Field Instructors	ASMSU Basic w/ Field Day	80
12/6/2015	Field Instructors	ASMSU Basic w/ Field Day	75
12/6/2015	Gidley	Awareness @ Redline in Butte	6
12/8/2015	Gidley	Awareness for Snowmobilers @ Yellowstone Mo-	15
12/8/2015	Bilbrey	Awareness @ MSU - Billings	15



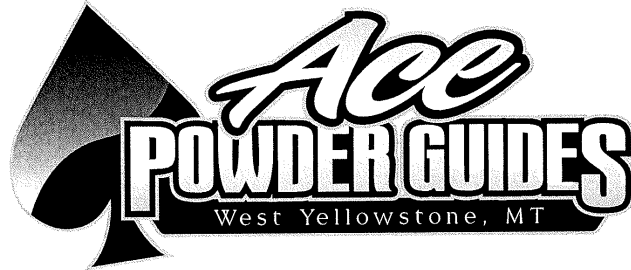


12/8/2015	Greeno	BHS BC ski club	25
12/9/2015	Bilbrey	Awareness @ Great Falls	25
12/9/2015	Olson	Awareness @ REI	30
12/9/2015	Gidley	Snowmobile Awareness in Big Timber	31
12/10/2015	Chabot	Current conditions for Ice Fest	250
12/10/2015	Bilbrey	Awareness @ Basecamp, Helena	45
12/11/2015	Greeno/Hance	Beacons practice @ Anderson School	55
12/15/2015	Hance	Awareness and Beacon 101 @ Beall Park	18
12/17/2015	Knoff/Gidley	Snowmobile Intro to Avalanches w/ Field day, West Yellowstone	15
12/18/2015	Knoff/Gidley/ Norlander	Snowmobile awareness field day in West Yellowstone	9
12/23/2015	Zavora	Awareness @ Cooke City	15
1/2/2016	Norlander	Awareness @ West Yellowstone	28
1/5/2016	Greeno	Awareness @ BHS	98
1/6/2016	Darham	Women's awareness and beacon 101 @ Beall Park	40
1/7/2016	Greeno	Awareness and Beacons @ BHS	74
1/8/2016	Hance	Companion Rescue Course @ REI	12
1/9/2016	Hance/Ramos	CRC Field @ Hyalite	12
1/9/2016	Norlander	Awareness @ West Yellowstone	20
1/12/2016	Olson	Awareness @ NW energy, Bozeman	63
1/13/2016	Greeno	Awareness @ Helena H.S.	54
1/13/2016	Olson	Awareness @ REI, Bozeman	35
1/13/2016	Knoff	Awareness @ GVSA	20
1/14/2016	Hance	Awareness @ NW Energy, Livingston	16
1/14/2016	Hance	Awareness @ MSU w/ ladies BC club	40
1/14/2016	Gidley	Awareness @ Neptune Brewery, Livingston	18
1/16/2016	Zavora	Awareness @ Cooke City	15
1/16/2016	Gidley	CRC for snowmobilers in Cooke City	32
1/17/2016	Gidley	Identifying and moving in avalanche terrain for snowmobilers	20
1/19/2016	Dunn	Awareness @ UM Western, Dillon	30
1/20/2016	Knoff/Hendrikx	ASMSU Basic w/ Field Day	180
1/21/2016	Marienthal/Chabot	ASMSU Basic w/ Field Day	180
1/23/2016	Field Instructors	ASMSU Basic w/ Field Day	75
1/23/2016	Dunn/Bilbrey	Intro to Avalanches w/ Field Day in Dillon, MT	16
1/23/2016	Norlander	Awareness @ West Yellowstone	27
1/24/2016	Field Instructors	ASMSU Basic w/ Field Day	80

1/24/2016	Dunn/Bilbrey	Intro to Avalanches w/ Field Day in Dillon, MT	16
1/27/2016	Birkeland	MSU Advanced Class	40
1/28/2016	Knoff	MSU Advanced Class	40
1/29/2016	Hance	Awareness @ Gateway Youth Group	
1/29/2016	Greeno	Awareness @ Big Sky H.S.	60
1/30/2016	Gullett	Awareness at Lewiston County Fair	13
1/30/2016	Norlander	Awareness @ West Yellowstone	30
1/30/2016	Steckmest	CRC in Cooke City	6
1/30/2016	Field Instructors	Advanced field day	37
1/30/2016	Marienthal/Mancey	Beacon practice at GVSA poker ride	50
2/1/2016	Bilbrey	Awareness @ NWE monthly teleconference	
2/3/2016	Bilbrey	Awareness for USSA ski racers	70
2/5/2016	Dunn	Intro avalanches, rescue focus - Beaverhead SAR	
2/6/2016	Dunn/Gidley	Intro avalanches, rescue focus - Beaverhead SAR	
2/6/2016	Norlander	Awareness @ West Yellowstone	25
2/9/2016	Gidley	Awareness @ Summit Motorsports	6
2/10/2016	Darham	Awareness @ REI	35
2/12/2016	Norlander	Awareness for MT FWP, West Yellowstone	30
2/13/2016	Turnage	CRC for Madison Valley SAR, Ennis	
2/15/2016	Marienthal	Awareness/Refresher for GVSAR Posse	35
2/16/2016	Greeno	Awareness @ Livingston H.S.	28
2/19/2016	Olson	Companion Rescue Course @ REI	14
2/20/2016	Hance/Wooldridge	Companion Rescue Course Field Day	14
2/20/2016	Norlander	Awareness @ West Yellowstone	22
2/23/2016	Hance/Berman	STEM Beacon Demo @ Mornirngstar Elementary	
2/24/2016	Darham	Awarness @ Roskie, MSU	23
2/25/2016	Norlander/Hance	Rescue Training/Demo @ Snowshoot, West Yellowstone	56
3/1/2016	Norlander/Gidley	Rescue Training/Demo @ Snowshoot, West Yellowstone	62
3/3/2016	Greeno/Wooldridge	Beacon Training/Demo @ Big Sky H.S.	55
3/6/2016	Knoff	AVPRO - Big Sky	25
3/9/2016	Olson	Awareness @ REI	7
3/9/2016	Ramos/Guarino	Beacon and Snowpack demo w/ Headwaters Academy	15
3/10/2016	Wooldridge/Guarino	Beacon and Snowpack demo w/ Headwaters Academy	16
3/17/2016	Bilbrey	Avalanche science @ M.O.S.S.	11



## Letters of Support



To Whom it May Concern,

We at Ace Powder Guides fully support The Gallatin National Forest Avalanche Center's RTG application.

Ace Powder Guides specializes in backcountry snowmobile trips in the Gallatin, Caribou-Targhee and Beaverhead-Deerlodge National Forests. Each season we provide over 100 guided tours to clients with all levels of experience in backcountry snowmobiling, backcountry travel and avalanche knowledge. The GNFAC is a vital resource for our service.

Each morning when our trips begin, we cover a variety of business and safety factors with each group, two of which are providing the clients with avalanche safety equipment and a brief update of the current avalanche conditions. All our guides are Level 1 &/or 2 avalanche certified and have a first hand view of the snow conditions in the areas we ride. However, there is no way we can keep up with the subtle and constant changes in the snow pack as the experts at the GNFAC Doug Chabot, Eric Knoff and Alex Marienthal do. Their daily avalanche advisory is valuable tool for our business by keeping our guides up to speed with these constant changes.

The GNFAC has provided level 1 and level 2 classes for our guides, guides of other snowmobiling businesses and the general public. These classes have given us the tools to further educate our user group, renters and guided clients about proper use of beacons, navigating avalanche terrain safely, proper rescue techniques and assessing snow stability. The GNFAC crew's knowledge, proficiency and commitment to avalanche study is vital to the safety of our clients through the education they provide. Brochures, podcasts, emails, phone advisories, youtube videos, 1 hour classes, level 1 & 2 cert. classes are a small list of services the GNFAC provides to our community and visiting tourists, not to mention the countless hours in the field for snow and avalanche assessments, accident reports, weather stations, etc.

We are certain the important work of the GNFAC has kept the backcountry of SW Montana a safer and more enjoyable place for all winter user groups. We thank them for their hard work and can only hope it continues.

Thank You,

Ace Powder Guides Crew



Montana State University  
P.O. Box 174200  
Bozeman, MT 59717-4200

**Telephone** (406) 994-3621  
**Fax** (406) 994-6911

[www.montana.edu/outdoorrecreation](http://www.montana.edu/outdoorrecreation)

January 26, 2016

To whom it may concern,

Greetings. My name is Ryan Diehl, Director of Montana State University Outdoor Recreation Program. I would like to assert our full organizational support for Gallatin National Forest Avalanche Center in their campaign for a recreation trails grant through Montana Fish, Wildlife and Parks. The Gallatin National Forest Avalanche Center is an indispensable resource for our campus community during the winter recreation season. We rely heavily on, and share, their advisories with our student population. Additionally, our educational partnership is highly valuable, educating approximately 450-500 participants on a yearly basis. We hope that by awarding this grant, we are able to continue this long-standing partnership into the distant future.

In addition to our educational partnership and the daily advisories, we rely heavily upon the web site as a valuable source of information for local weather, reports, tutorials and other resources. The Gallatin National Forest Avalanche Center is an incredibly professional organization with an impeccable reputation, which provides highly valuable information to our user base. I pass along the highest recommendation that they receive full consideration for the Fish, Wildlife and Parks Recreation Program Grant award. The hard work and dedication that they put forth informs the winter recreation community of objective backcountry hazards, greatly assisting in keeping all participants safer and better informed.

I am available at: [ryan.diehl1@montana.edu](mailto:ryan.diehl1@montana.edu) to more fully elaborate should you want to contact me directly. I appreciate your time and consideration.

Kind Regards,

Ryan Diehl  
Director





Don Bachman  
3910 Sourdough Rd.  
Bozeman, MT 59715

February 2, 2016

Letter in support of the Gallatin National Forest Avalanche Center application to Montana Fish Wildlife and Parks Recreational Trails Program.

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Dear Grant Reviewer:

The Gallatin National Forest Avalanche Center (GNFAC) provides accurate and timely snowpack characteristics and avalanche stability evaluation and forecasting information to the Montana public, and therefore is a valuable governmental service to recreation users. Additionally, this service is available to operational search and rescue responders, who utilize the GNFAC services when necessary to perform their mission.

I judge the value of this service based upon my background in avalanche forecasting and control including 4 winter seasons assisting in the initiation and daily operation of the Colorado Avalanche Warning Center of the US Forest service in 1975 – 1980. I have maintained an active career in this avalanche-related field through 2001, and continue to inform myself of conditions to this day.

The daily advisories produced by the GNFAC, in my opinion, should set the standard of clarity and comprehensiveness for other such avalanche centers in Montana, and through-out the west, including Wyoming, Colorado, Utah, California, Washington and Idaho. The GNFAC advisories are communicated through a website which attracts over 4,000 hits per day and provides exceptional supporting resources including videos and photos of snow conditions and near real time remote weather instrumentation in addition to avalanche incidents, snow pit profiles, accident reports, technical publications and observer feedback. Center personnel are actively engaged in field investigation of snowpack characteristics through-out the forecast area on a rotating daily basis. Center personnel are also engaged in avalanche-related education for winter use participants through-out the region, including the snowmobile community as well as back and sidecountry skiers, including about 25% youth. These amounted over 6,000 participants in 2014-15. Additionally, the Center has direct interaction with the US Forest Service National Avalanche Center and the Montana State University Snow Science Graduate Program.

As the GNFAC enters its 26<sup>th</sup> year of existence the need for such a valuable state and federally supported service continues. Recreational winter use on public lands is clearly growing at a rate which continues to produce avalanche incidents which sadly result in injury and fatality. Montana is second in the nation in avalanche fatalities. This unfortunate statistic would be even worse was it not for the efforts of the Gallatin National Forest Avalanche Center and the ongoing support of the Recreational Trails Program and other supporting entities. Please continue to provide your critically needed support.

Sincerely,

Don Bachman



March 24, 2016

To Whom it may concern:

The service that The Gallatin National Forest Avalanche Center provides is invaluable to myself, local backcountry ski guides and outdoor enthusiasts throughout South West Montana.

As the owner and lead guide for Beartooth Powder Guides in Cooke City, Montana, the information that the GNFAAC provides on a daily basis throughout the Winter/Spring season's is crucial to the decision making process for our guides, guests and myself. We use the advisory and the links to weather stations on [mtavalanche.com](http://mtavalanche.com) on a daily basis.

In addition to these services being beneficial to Beartooth Powder Guides employees and guests, the GNFAAC provides avalanche education to over 5000 people a year. The demographics of the people being educated by the GNFAAC range from children, snowmobiler's, skier's/snowboarder's. These classes are provided at an affordable price for all (sometimes free)

The daily advisories, video's, online tutorials and weather station links are important for public safety and help reduce accidents and fatalities in the backcountry for the public.

Southwest Montana is fortunate to have the GNFAAC as a resource and continued support from grant monies, donations and public support is crucial to keeping this program going.

Best regards

Ben Zavora  
Owner/Lead Guide  
Beartooth Powder Guides  
Cooke City, Montana



January 25, 2016

Doug Chabot  
Director  
GNF Avalanche Center

Dear Doug,

This is a letter in support of your Recreation Trails Grant application. The avalanche education the Avalanche Center does and all the information available on your website from your daily advisories to wind and weather information is very useful and valuable to all winter backcountry users. I strongly support your grant application.

Sincerely,

Randy Elliott  
General Manager  
Bridger Bowl



203 EATON STREET – P.O. Box 1120 - COOKE CITY, MT 59020  
(406) 838-2231 - FAX (406) 838-2225 – COOKECITYMOTORSPORTS.COM

2-2-2016

To whom it may concern;

We are writing in support of the GNFS Avalanche centers RTP grant funding.

Simply put: this is a 26 year strong organization that has done an awesome job in bringing avalanche awareness to winter sport enthusiasts.

A bit about us;

In 2010 we purchased the Arctic Cat/ Yamaha snowmobile dealership in Cooke City, Montana. We were introduced to the members of the GNFAC that year and sponsored their snowmobiles to them the in 2011. The 10-11 season brought lots of snow and a stable snowpack.

The 11-12 snow season was not as much fun.

New Years Eve of 2012 we lost a customer and friend to an avalanche. The 11-12 seasons resulted in 3 deaths to avalanches in the Cooke City area.

The 13-14 season was a wild one as well; we lost an 18 year old boy that was with a group that ignored the warnings. This group had no beacons, shovels or probes, the basic tools for backcountry adventures. I personal talked to this group about the avalanche dangers and what the reports from GNFAC said for the day. People will make bad decisions; I wish they would keep their bad decision making to Las Vegas not the Rocky Mountains. This was preventable, if they would have listened to the GNFAC.

We had a burial this season that left a man several feet under the surface but was able to survive because his group was prepared. They found him with their beacons gave him CPR and he was able to ride out on his own. This group has spent time studying the GNFAC warnings and rescue training.

14-15 Again we lost a dear friend to an avalanche on Thanksgiving Day. This was an experienced rider with all the right tools. I would bet he received the warnings on his I-Pone. Another bad decision, he knew better than to do what he done, another life gone and another family grieving. With that said how many right decisions have been made with the right education, we will never know that answer.

This heightened our determination to educate our customers in avalanche awareness, safety and protection.





We quickly determined that the single, most essential tool to keeping our customers safe was the daily avalanche report emailed and faxed to local businesses and the general public, by the Avalanche Center.

The daily report gives us the opportunity to discuss the conditions with our customers and warn them of dangerous situations before they encounter them. The majority of snow enthusiasts that come to Cooke City are on vacation and are eager to get to the snow. Many times, in their excitement, they forget or fail to realize how dangerous the conditions can be. When we have the daily avalanche report at 7am we are able to open a dialog with our customers that make them think about the conditions before they head out to the snow.

We also have the “hands-on” guidance of the Avalanche Center. They consistently visit our area and ride, test and determine conditions. They are always willing to visit with riders, skiers and boarders about the conditions and the service they provide.

The Avalanche Center has become a vital tool in our business. Without them riding in our area would be like flying thru the mountains in an airplane blindfolded. The Avalanche Centers subscribers will continue to grow with the use of smart phones and their app.

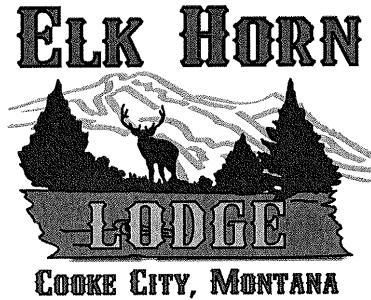
Their website, [www.mtavalanche.com](http://www.mtavalanche.com) provides incredible video, pictures and accounts of the snow conditions past, present and future.

We follow several agencies that provide the weather and conditions so that we can best determine the conditions and best areas for our customers. We have found that the GNFAAC is consistently the most accurate in their reporting.

We will continue to support the GNFAAC because of the stellar work they do and their true commitment to protecting snow enthusiasts. We encourage all businesses, individuals and government agencies to support the GNFAAC in any capacity they can.

*Mona & Shannon Abelseth*  
Cooke City Motorsports

“we sell fun, the GNFAAC helps make fun safe”



February 3, 2016

To Whom It May Concern:

I am writing this letter in support of the Gallatin National Forest Avalanche Center. My husband and I own the Elk Horn Lodge located in Cooke City, Montana. We operate during the winter season and depend on the Avalanche Center Advisories that we receive by 7:30 am each morning during the winter season. Living in a remote high avalanche area it is crucial that we receive these advisories as it provides us with information about the conditions on the mountain! We in turn, provide this information to our customers so they can make good riding or skiing decisions. Our customers depend on these advisories to determine if it's safe for them to go out snowmobiling or skiing. When the avalanche danger is HIGH we recommend to our customers to not go out! These reports also provide us information on the weather, helps us understand the snowpack and provides us with accident reports.

Not only does the Gallatin National Forest Avalanche Center provide advisories daily they also conduct avalanche education here in Cooke City. We have had some customers who planned their trip so they could attend one of these classes. We also work closely with the Gallatin National Forest Avalanche Center as both my husband and I are members of the Search and Rescue team here in Cooke City! We fully support the Gallatin National Forest Avalanche Center's Recreation Trails Grant application. We recommend that you consider how vital the information is needed that they provide to business owners, customers, and search and rescue personnel in our remote area when making your grant decision. Thank you in advance for your consideration!

Lisa and Jeff Ohlinger  
Owners  
Elk Horn Lodge  
Cooke City SAR Team



**OFFICE OF THE SHERIFF/CORONER**  
GALLATIN COUNTY, MONTANA

**Brian M. Gootkin**  
Sheriff

**Dan Springer**  
Undersheriff

**Warren Hiebert**  
Chaplain

**Jason Jarrett**  
Jail Administrator

615 South 16<sup>th</sup>  
Bozeman, Montana 59715

February 11, 2016

Montana Fish Wildlife and Parks  
Trails Program Grant

Dear Decision Makers,

The Sheriff's Office would appreciate your positive consideration of the grant application from the Avalanche Center. Having statutory responsibility for Search and Rescue and Public Safety in general, the Sheriff relies heavily on the Avalanche Center and its employees. Like you we have supported the Center financially in the past because they are effective in educating the public and most certainly have saved lives with their programs. In addition to the education part we count on them for expertise when SAR units are active in avalanche country. They are always willing and able to be part of our rescue and search operations. It is often difficult to make decisions that promote the most good but supporting the Avalanche Center should not be one of them. In our view this program works and does make a positive difference. Should you have any questions please contact me at the number below. Thank you for your consideration.

Lt. Jason Jarrett  
Gallatin County Sheriff's Office  
Search and Rescue Commander  
(406)-582-2105  
[Jason.jarrett@gallatin.mt.gov](mailto:Jason.jarrett@gallatin.mt.gov)



Jerry Johnson  
1/25/16

Mr. Doug Chabot, Director  
Gallatin National Forest Avalanche Center  
PO Box 130  
Bozeman, MT 59715

Doug –

#### Political Science

Thanks for asking me to write a letter of support for your efforts to secure a Fish, Wildlife and Parks Recreation Trails Program grant for the continued operations of the Avalanche Center. Of course I am only too happy to do so and am pleased to offer that wholehearted support to the grant reviewers.

Winter 2015/16 is, unfortunately, shaping up to be a bad one for avalanche accidents and sadly, Montana's mountains are the setting of avalanche fatalities. Progress toward greater safety is steady however and the work of the GNFAAC is responsible by providing wide regional coverage of avalanche hazard information, research, incident reports, and education to winter recreationists on foot, skis and snowmobiles. It is making a difference.

On November 11, 2015 we held the first and hopefully annual MSU Snow and Avalanche Workshop on campus and hosted over 400 people. You and your center staff were integral to the success. After presenting three educational lectures on regional avalanche hazard your entire staff was called out on an early season backcountry ski accident. That was a long and stressful day and one not out of the ordinary. I look forward to the Center's help and participation as we organize future events and I'm glad we were in a position this year to make a modest contribution to the Center.

I am an active backcountry skier and start most winter days by reading the avalanche report – I depend on it for high quality up to date information and I'm not alone. Every morning skiers and snowmobilers from the region and those who plan on visiting log on and gain a better understanding of the snowpack. We understand this sort of quality information does not come easily. You and your crew help make Montana's backcountry a national destination for all kinds of winter recreation – thank you. I urge FWP to fully fund your grant request. It is a good investment.

Yours,

Jerry Johnson,  
Professor Political Science  
Research Affiliate in MSU Snow and Avalanche Laboratory

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