

## **GNFAC Avalanche Advisory for Mon Dec 23, 2013**

Good morning. This is Eric Knoff with the Gallatin National Forest Avalanche Advisory issued Monday, December 23 at 7:30 a.m. **Mystery Ranch** in partnership with the Friends of the Avalanche Center sponsors today's advisory. This advisory does not apply to operating ski areas.

### **AVALANCHE WARNING**

**ISSUED ON December 22<sup>nd</sup> AT 4:30 PM**

The Gallatin National Forest Avalanche Center is issuing a **Backcountry Avalanche Warning for the Bridger Range and northern Gallatin Range**. Over the past few days more than twenty inches of snow has fallen on an unstable snowpack. Strong winds out of the west-northwest have transported snow onto leeward slope causing additional stress. **The avalanche danger is rated HIGH on all slopes in the Bridger Range and northern Gallatin Range**. Very dangerous avalanche conditions exist. Travel in avalanche terrain is not recommended and avalanche runout zones should be avoided.

Go to [www.mtavalanche.com/current](http://www.mtavalanche.com/current) for the most current avalanche information.

This warning will either be terminated or updated by 6:30 AM on Tuesday, December 24<sup>th</sup>.

### Mountain Weather

Over the past 24 hours the mountains around Bozeman and Big Sky as well as Cooke City picked up 4-6 inches of new snow. The southern Madison Range and Lionhead area near West Yellowstone picked up 2-4 inches.

This morning, temperatures are 10 degrees F around Cooke City and West Yellowstone and the mid to high teens elsewhere. Skies are partly to mostly cloudy and winds are blowing 10-20 mph out of the west-northwest. Today will be the warmest day of the week with highs climbing into the upper 20's to mid-30's F. Winds will gradually increase through the day as the next storm system approaches from the northwest. There is a slight chance of mountain snow showers this afternoon with an increasing chance for snow tonight and tomorrow. The mountains around Bozeman and Big Sky will receive 2-4 inches by tomorrow. The southern mountains will likely pick up 4-6 inches.

### Snowpack and Avalanche Discussion

#### Bridger Range Northern Gallatin Range

Since Friday, nearly two feet of snow has fallen in the Bridger Range and Northern Gallatin Range. SWE (snow water equivalent) totals are 2.1" at [Brackett Creek Snotel](#) site and 1.3" at [Shower Falls Snotel](#) site. Higher amounts likely fell at upper elevations. This rapid and heavy load has been deposited on a weak and unstable snowpack.

On Saturday, two skiers were caught in an avalanche north of Bridger Bowl resulting in one serious injury. Also on Saturday, Mark found unstable conditions near Fairy Lake in the northern Bridgers ([photo](#), [video](#)). Since that time 10" of new snow and 1" of SWE has been add to the snowpack in the Bridger Range. Skiers also found unstable conditions in the northern Gallatin Range over the weekend.

Avalanches will be likely within the new snow as well as on deeper layers in the snowpack. The new snow is upside down, meaning higher density snow rests on top of lighter, lower density snow. This type of instability is typically short lived, but can create unstable conditions a day or two after the storm.

The main problem is the amount of weight being added to a faceted layer about a foot off the ground. Any slope harboring this layer will likely be hair trigger.

Today, both natural and human triggered avalanches are likely, especially on wind loaded slopes. It will be possible to trigger avalanches from a distance including from the bottom of the slope. Today, the avalanche danger is rated [HIGH](#) on all slopes.

#### Madison Range   Southern Gallatin Range

The southern Madison Range, Southern Gallatin Range and mountains around Big Sky have also received heavy snowfall in the past few days. The difference here is the new snow that has fallen has been low density (3-5%), which in turn is putting less weight and stress on the snowpack. Over the past few days, these areas have received between .7 to 1" inch of SWE totaling close to 18 inches of snow.

Yesterday, Doug and I rode Buck Ridge south of Big Sky and were blown away by the sheer amount of snow. We were also surprised not to see recent avalanche activity. We concluded the recent snow, although deep, was not enough added weight to produce a natural avalanche cycle. However, the snowpack structure remains poor. I don't trust the snowpack in this area as far as I can throw my Yamaha four stroke.

Today, a poor snowpack structure combined with new snow and wind will make for dangerous conditions and the avalanche danger is rated [HIGH](#) on wind loaded slopes. Non-wind loaded slopes have a [CONSIDERABLE](#) avalanche danger.

#### Lionhead area near West Yellowstone

The Lionhead area has the shallowest and weakest snowpack in our forecast zone ([video](#)). For better or for worse, this area received the least amount of snow during the latest series of storms. [Madison Plateau Snotel](#) site has received .5 inches of SWE over the past 4 days. This is not a tremendous load, but it's significant enough to cause concern.

Wind loaded slopes will be the most unstable, but avalanches may also occur on non-wind loaded slopes.

Today, human triggered avalanches are likely and the avalanche danger is rated [CONSIDERABLE](#).

#### Cooke City

The primary avalanche concern for the mountains around Cooke City is wind loaded slopes. Slopes leeward to west-northwest winds will be the most likely to hold wind deposited snow. In upper elevation terrain, wind slabs should stay confined to the new snow. This problem is fairly easy to manage. If the slope looks heavily loaded or feels hollow beneath your skies or snowmachine it will be best to move elsewhere.

A trickier problem is the scattered distribution of buried persistent weak layers. This problem seems to be most prevalent in areas that had a shallow snowpack during the severe cold snap earlier this month. In addition to facets buried deeper in the pack, isolated slopes have a layer of surface hoar buried 2.5 feet deep that can also produce avalanches ([video](#)).

Knowing which problem exists on a given slope requires careful snowpack evaluation. For these reasons today, the avalanche danger is rated **CONSIDERABLE**.

Doug will issue the next advisory tomorrow morning at 7:30 a.m. If you have any snowpack or avalanche observations drop us a line at [mtavalanche@gmail.com](mailto:mtavalanche@gmail.com) or call us at 587-6984.

## **BACKCOUNTRY SKIERS AND RIDERS NEEDED FOR MSU SURVEY**

This project aims to collect GPS location information and survey responses from backcountry skiers and riders to better understand what types of terrain decision we make. The focus is on backcountry skiers and riders of all abilities and experience. You need not be an expert backcountry skier to participate in this research. For more information and to sign up: [www.montana.edu/snowscience/tracks](http://www.montana.edu/snowscience/tracks)

## **SNOWMOBILE AVALANCHE EDUCATION**

The Canadian Avalanche Association produced a series of videos titled “Throttle Decisions” on avalanche safety for snowmobilers. [Mark’s blog post](#) outlines the topics.

## **EVENTS/EDUCATION**

WEST YELLOWSTONE: Sunday, December 29, 10 a.m., **Companion Rescue Clinic for Snowmobilers**, Pre-Registration is required. <https://www.ticketriver.com/event/9387>

BOZEMAN: Wednesday, January 1, 10 a.m., **Hyalite Tour** at the Hyalite Reservoir. Classic skiing, free waxing and free lunch.

More info: <http://www.mtavalanche.com/images/13/hyalite-tour-2014>