

BRIDGER PEAK AVALANCHE – Tuesday, February 19, 2013

Synopsis:

A skier was caught, almost fully buried and injured in an avalanche on the east side of Bridger Peak in the southern Bridger Range of southwest Montana. He was the last person in a group of four to descend the slope. Two of them skied through the starting zone on the skier's right side and a third skier descended an adjacent path further to the right. The fourth skier descended slightly skier's left and stopped on top of an exposed rock band. He jumped off the rocks, landed, made another turn or two, and triggered the avalanche that broke 3-4 feet deep and 100 feet wide. He was carried almost 1500 vertical feet and buried in a standing position with only his hands exposed. He suffered such a bad contusion that his partners suspected a broken femur. He was evacuated to a hospital via helicopter.

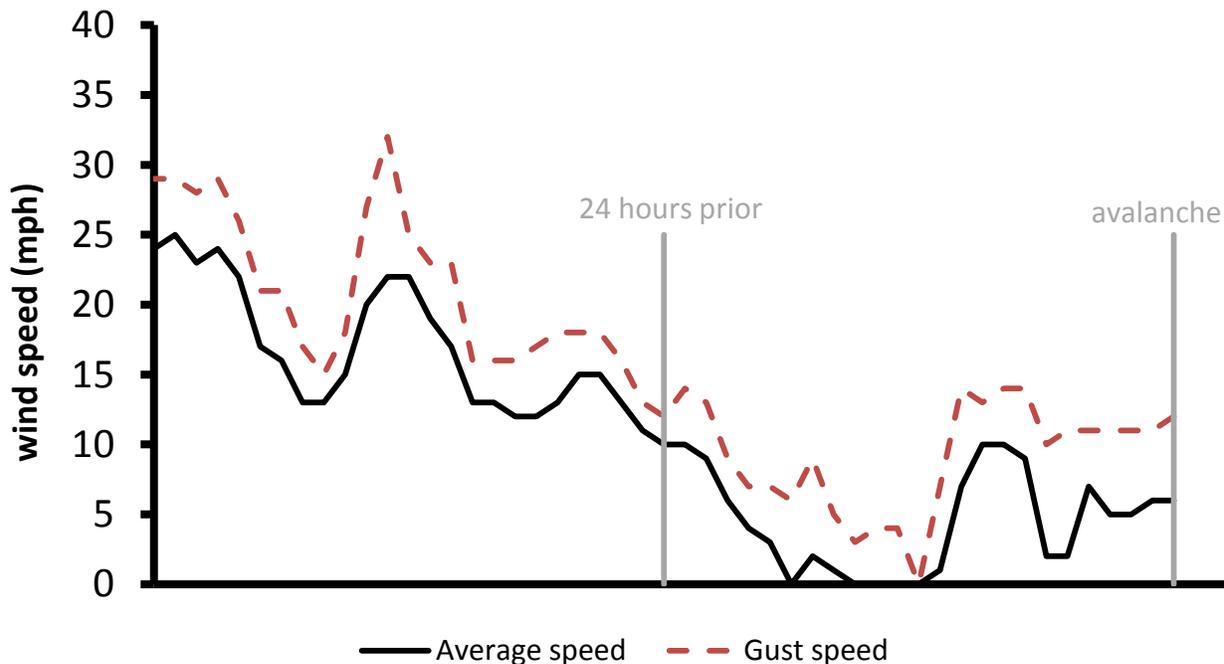


Overview of the avalanche path. Small red arc shows the location of the crown. Inset photo shows the avalanche crown and the path taken by the skier who triggered the avalanche. The toe of the debris was about the end of the dashed line.

Weather:

The Bridger Bowl Ski Area 3.5 miles north provides weather data. No snow had fallen for 24 hours prior to this avalanche and winds had been uncharacteristically calm. At the Ridge Station at Bridger Bowl, the maximum sustained winds had been only 10 mph from the SSE with gusts of 14 mph. This avalanche occurred around midday Tuesday. The most recent snow fell over the President's day weekend from Saturday morning to Monday morning. The Alpine Station recorded 13 inches of snow during this storm containing 1.2 inches of snow water equivalent. The Bridger Station recorded 16 inches of snow during this storm.

48 hours of wind speed at the Bridger Ridge Station



Snowpack:

The GNFAAC investigated this avalanche the following day and recorded a crown profile on the southern edge of the crown. The weak layer was a 5 cm thick layer of very small facets buried 95 cm (~3 ft) deep and 105 cm (~3.5 ft) above the ground. However in the northern half of the crown, this weak layer was buried less deep, was softer, and contained larger faceted crystals. In spots this layer was 2 ft above the ground. In other spots (possible trigger points) this layer was even weaker and rested on rocks exposed by the avalanche.

Two skiers descended the southern half of the avalanche path and did not trigger the slide. The skier who was caught jumped off the rock band (about 8 ft tall) and landed in the zone where the weak layer was softer, weaker, and buried less deep. It is possible he triggered the slide near one of the rocks seen in the bed surface. Another snow profile was recorded only 100 ft from and slightly above the crown. A similar layer of facets were found in the middle of the snowpack. This layer was very obvious while digging and produced a stability test score of ECTP 21.



Tracks from the first 3 skiers
Tracks from the fourth skier

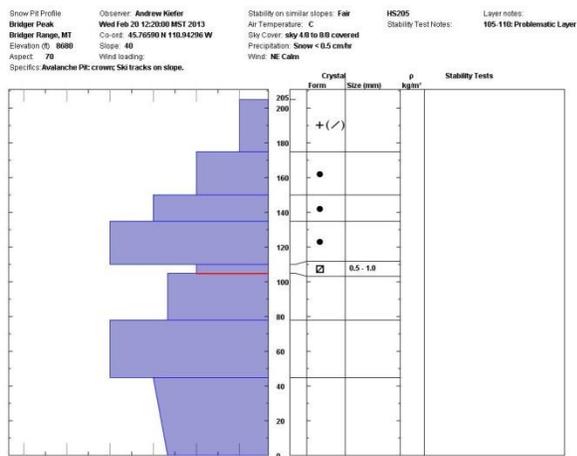
Three skiers descended first. The final skier jumped over a rock band at the red line and triggered the avalanche approximately at the X.

See a video from the crown at: <http://bit.ly/UNc2MD> and a video when the weak layer formed in early to mid January: <http://bit.ly/1387Omx>

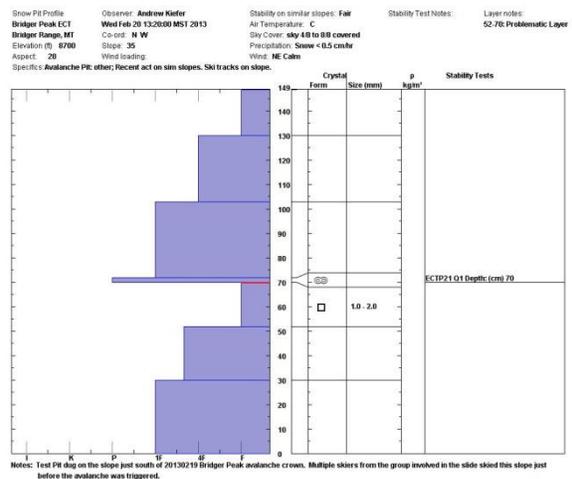
See photos of the crown (<http://bit.ly/YejMW3>), the path (<http://bit.ly/XC4uuQ>), and the debris (<http://bit.ly/YpvM4Y>)

Click on the snow profiles for a link to the full size image.

Crown profile



Nearby snow profile



Rescue:

The fourth skier tried to ski out of the avalanche but was not successful. He was carried almost 1500 vertical feet and impacted a tree with his legs along the way. For several seconds he was buried at the lower bench in the runout zone. A second wave of avalanche debris pushed him off the bench. As the debris was moving, he dog paddled and fought to remain upright working to keep his hands near his face and head. The avalanche buried him in a standing position with his arms above his head and only his hands exposed. His airway was choked with snow; however, he was able to wiggle his arms just enough to free them and clear snow away from his face.

His partners were watching him from the very bottom of the gully. After he jumped off the rock band, they lost sight of him but soon saw the rumbling powder cloud. Once the debris came to rest, two of them ascended to the toe while the third remained in a safe location in case of another slide. They quickly found the buried skier and dug him out of the debris. They used several methods to transport him downhill but the pain in his leg became worse, and they suspected a broken femur. Gallatin County Search and Rescue was notified. This group prepared a good helicopter landing zone, and SAR dispatched Summit Air Ambulance who treated and transported the injured skier to Bozeman Deaconess Hospital. Fortunately the skier did not break his femur or suffer other major injuries.

Lessons:

This was a very experienced party in terms of skiing ability, snowpack assessments, avalanche rescue, and medical care. Two are professional ski patrollers. There had been no avalanche activity associated with the President's day weekend storm. There had been minimal winds, and this group did not observe any signs of instability. The main lesson is that we **must constantly be prepared** for an avalanche when skiing or riding in avalanche terrain. This group was prepared, conducted a quick and efficient rescue. In hindsight one member of the group could have stopped in a safe zone half way down the run.

Fortunately, the skier who was caught was buried near the bottom edge of the debris. Had he been buried on one of the higher benches where avalanche debris accumulated, it could have taken his partners much longer to reach him. However, a skier stationed at a mid-point along the track of the avalanche path could have quickly descended to the burial location. When skiing, **choosing safe zones is a very difficult task**. Many slopes in the Bridger Range do not have many safe zones except at the bottom of the avalanche path. Mid-point safe zones are often subtle features where the price of choosing the wrong spot is adding another person to the avalanche. Multiple burials rarely have happy endings.

In avalanches such as this one you rarely have much control. Whether or not you will die from trauma is a matter of luck. However, this skier fought to survive from the beginning to the end. Initially he tried to ski off the slab. When that failed he fought as hard as possible to stay on top of the debris and keep his hands near his face. Whether you are the one caught or a rescuer in a seemingly hopeless situation, **never give up**.

For further information or questions, please contact Mark Staples at mstaples@fs.fed.us or 406-587-6984