

Henderson Mountain Avalanche Fatality

1 snowmobiler caught, buried and killed

Gallatin National Forest

31 December 2011

Synopsis

Three snowmobilers ascended a steep, narrow drainage above Fisher Creek on Henderson Mountain outside of Cooke City. The drainage delivered the riders into steep, open terrain on the northeast face. The victim climbed to approximately 9,800 ft where he triggered the slide. He was able to turn downhill, but was caught as he descended the slope. His head was buried 2-3 feet deep and the heel of his boot was sticking out of the snow. He was found and uncovered in approximately 10-12 minutes, but did not survive. The crown of the avalanche ranged from 1-4 feet deep and 300-400 feet wide. The slide ran a total of 1,000 vertical feet. The slope angle at the trigger point was 35°, but increased to 40° near the upper portion of the crown. The alpha angle was 33°. The debris ranged from 7-10 feet deep near the toe of the slide. US classification of the avalanche is SS-AM-D3-R4.

GPS Coordinates

Crown: N 45 03'21.02, W 109 57'02.52

Victim Location: N 45 03'33.57, W 109 56'52.92

Toe of Debris: N 45 03'33.86, W 109 56'48.06

Elevation of Crown: 10,200 feet

Photos

<http://mtavalanche.com/images/12/avalanche-fatality-cooke-city-1>

<http://mtavalanche.com/images/12/avalanche-fatality-cooke-city-0>

<http://mtavalanche.com/images/12/avalanche-fatality-cooke-city>

Videos

<http://www.youtube.com/user/AvalancheGuys#p/c/9C43F61223259BFE/0/0yLo9XNAL5s>

<http://www.youtube.com/user/AvalancheGuys#p/c/9C43F61223259BFE/1/DfMbUsVULts>

Weather

Snowfall and temperature data for this incident are from the Fisher Creek Snotel Site located .75 miles east of the accident site. Wind data is from the GNFAAC weather station at Lulu Pass approximately 1.5 miles northeast of the accident site.

During the 72 hours of stormy weather prior to the avalanche incident, Fisher Creek Snotel Site recorded four inches of SWE (snow water equivalent) totaling three feet of snow. Winds averaged 30-40 mph out of the WNW with gusts on the 29th and 30th hitting 60-70 mph. Temperatures ranged from 18° to 25° F. At the time of the accident, the temperature was 8° F, winds were blowing 10-15 mph out of the NW and skies were clear.

Avalanche

At approximately 11:50 am on December 31st, the victim, Rider 1, his son Rider 2, and a companion, Rider 3, accessed the northeast face of Henderson Mountain via a tight drainage above Fisher Creek. Rider 3 stopped at the top of the drainage while Rider 1 and Rider 2 continued up the open face, angling right to avoid the steepest section of the slope. Rider 2 continued veering right onto a less steep sub-ridge.

Rider 1 continued to climb up and left into steeper and more exposed terrain where he triggered the avalanche. Rider 1 was able to execute a downhill turn and was traveling down-slope when the avalanche caught him. He was carried 500-600 vertical feet downhill where he was entirely buried, except for the heel of his boot which was sticking out of the snow. His snowmobile was entirely buried, except for a small section of the right ski, approximately twenty feet below Rider 1.

Both Rider 3 and Rider 2 witnessed the slide, but lost sight of Rider 1 in the debris. Rider 3 was near the bottom of the slope and deployed his BCA air bag as he watched the slide move towards him. Fortunately he was not caught. Rider 3 and Rider 2 turned their transceivers to receive and began a search. Rider 3 found Rider 1's boot sticking out of the snow in a matter of minutes. After discovering Rider 1's boot, Rider 3 descended the steep drainage and informed other party members of what had happened. During that time Rider 2 began shoveling out his father. In a matter of minutes Rider 3 arrived back on scene with additional party members. They found Rider 1 face down with his head buried 2-3 deep, not breathing and with no pulse.

The group had Rider 1 completely unburied in 10-12 minutes after the avalanche occurred. Members of the group immediately initiated CPR. CPR had been in progress approximately 20-25 minutes before members of the Cooke City Search and Rescue arrived on scene. An AED was applied, but no shock was advised. At this time myself and partner arrived on scene. CPR was conducted for approximately 45 minutes before a physician in Cooke City gave notification to end CPR. Shortly after CPR was called off a member of the Cooke City search and rescue arrived on scene with a toboggan. The victim was taken to the Cooke City Fire Hall.

Every member of the party was experienced in mountain snowmobiling and had ridden the area numerous times. Each rider carried rescue gear and knew how to use it. They had seen a sign in the Exxon station saying the avalanche danger was HIGH. They did not see the daily advisory issued by the GNFAC. Rider 2 attended MSU and participated in an avalanche awareness course 10 years ago.

Information for this report was acquired from first hand interviews with Rider 2 and Rider 3 at the scene of the accident. Additional information was acquired during further interviews with Rider 2 and Rider 3 on the 4th of January.

Search and Rescue

My partner and I were at the cabins up Fisher Creek at 1145 on December 31st. We witnessed the snowmobiler on Henderson Mountain trigger the slide at approximately 1150 from .75-1 mile away. I used my hand held radio and dispatched the incident to Cooke City Search and Rescue, using Sheep Repeater. Members of Cooke City Search and Rescue arrived on scene approximately 20-25 minutes after receiving the call. My partner and I skied to the scene, arriving five minutes after search and rescue. The rescue was complete and the scene was clear by 1330.

Snowpack

During the 72 hour period before the accident the mountains around Cooke City received three feet of snow totaling four inches of SWE (snow water equivalent). The rapid and heavy load was deposited on top of weak, faceted grains at or near the ground, creating highly unstable conditions. To exacerbate the problem strong winds out of WNW blew during the storm, additionally loading leeward slopes.

We did not dig in the crown of the avalanche for safety reasons and the flanks were not practical. On representative slopes, my partner and I received very low test scores, ECTPV to ECTP 11 during stability tests the morning of the accident. We also remotely triggered a large slide from 30 feet away; unstable conditions were present. The layer of concern was the interface between the storm snow and weak, faceted grains of 1-2 mm in size at or near the ground.

An Avalanche Warning was issued the afternoon before the accident and was continued the day of the avalanche. The avalanche danger was officially rated HIGH on all slopes in the Cooke City area the day of the accident.

Avalanche Advisory - <http://www.mtavalanche.com/advisory/11/12/31>

Snowpit Profile - <http://mtavalanche.com/images/12/martys-slope-cooke-city?size=original>

Direct any questions regarding this report to eknoff@fs.fed.us or 406-587-6984

Eric Knoff
Avalanche Forecaster
Gallatin National Forest Avalanche Center

