Woody Ridge Avalanche Accident

3 skiers caught, 1 partially buried
Woody Ridge/Republic Creek Drainage, WY, Cooke City, MT
Shoshone National Forest, WY – March 24, 2022

AVALANCHE SYNOPSIS

On March 24, 2022 a group of six skiers descended the west side of Woody Ridge near an area locally known as KNB's. Approximately a third of the way down the slope the group triggered an avalanche that crossed three gullies, broke 1-3 feet deep, 275 feet wide (measured on GoogleEarth) and ran 700 feet vertical. Five skiers were stopped, watching one descend the slope. Three of the stopped skiers were in a row of dense trees directly above and adjacent to where the slide broke and two were stopped a few feet below the trees. The avalanche caught the skier and two members of the group who were stopped downhill of the trees. One skier was pinned against a tree and the avalanche passed him. The second skier slid into a tree sustaining multiple suspected rib fractures. The third, who was actively skiing, was caught, carried and partially buried with just his arm sticking out of the snow, 500 vertical feet below the avalanche crown. All three captured skiers successfully deployed their airbags.

The three remaining members of the group switched their avalanche transceivers to search and located all three victims, and unburied the partially buried skier within five minutes. All members of the group had formal avalanche training: Avalanche Level 1 and 2 up to a Pro Level 2. All members of the group had avalanche transceivers, shovels, probes and airbags. The group performed field first aid and self-evacuated to Cooke City.

GPS coordinates and elevation:

Crown: N 44.98950, W -109.92383; elev 9,670’
Partially buried skier: N 44.99037, W -109.92665; elev 9,150’
Toe of debris: N 44.91012, W -109.92777; elev 8,950’

Video: Click Here for YouTube video of accident investigation
Pictures: https://www.mtavalanche.com/node/26321

WEATHER

Seasonal snowfall, precipitation and temperature data are from the Fisher Creek SNOTEL site at 9,100’, 5 miles N of the accident site. Wind and temperature data are from the Lulu Pass weather station at 10,020’, 5.8 miles N of the accident location.

Between March 12 and 21 the Fisher Creek SNOTEL received 2 feet of snow equal to 2.1” of snow water equivalent (SWE). No snow fell from March 22-24 (Figure 1). Five to six days prior to the accident, wind was moderate to strong out of the southwest to south, then shifted to light to moderate out of the northwest for three days. The day of the accident wind was light to moderate out of the west-southwest (Figure 2). From March 17-22 temperatures ranged from single digits to low 30s F. On March 23

temperature reached 43 F at Fisher Creek SNOTEL (9,100') and 36 F at Lulu Pass (10,020'). Overnight from March23 to 24, the temperature at Fisher Creek dropped below freezing for two hours (31 F) before rising to 45 F at noon on the day of the accident. The temperature at Lulu Pass dropped into the high 20s F overnight, then reached 35 F by mid-afternoon on March 24 (Figure 3).

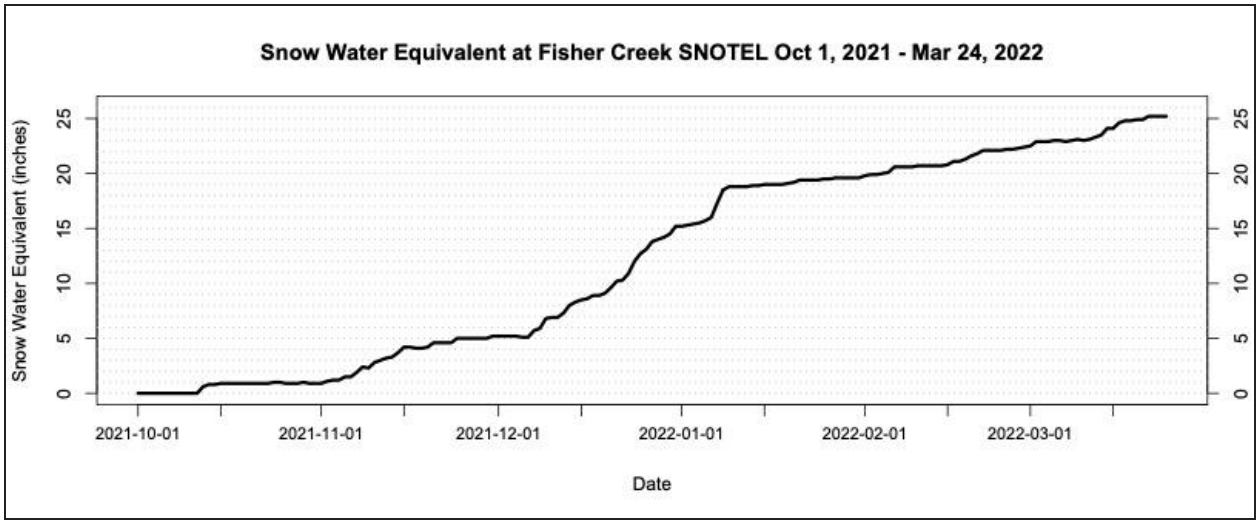

Figure 1. Snow water equivalent (start of day values at midnight) at Fisher Creek SNOTEL sites from October 1, 2021 to March 24, 2022.

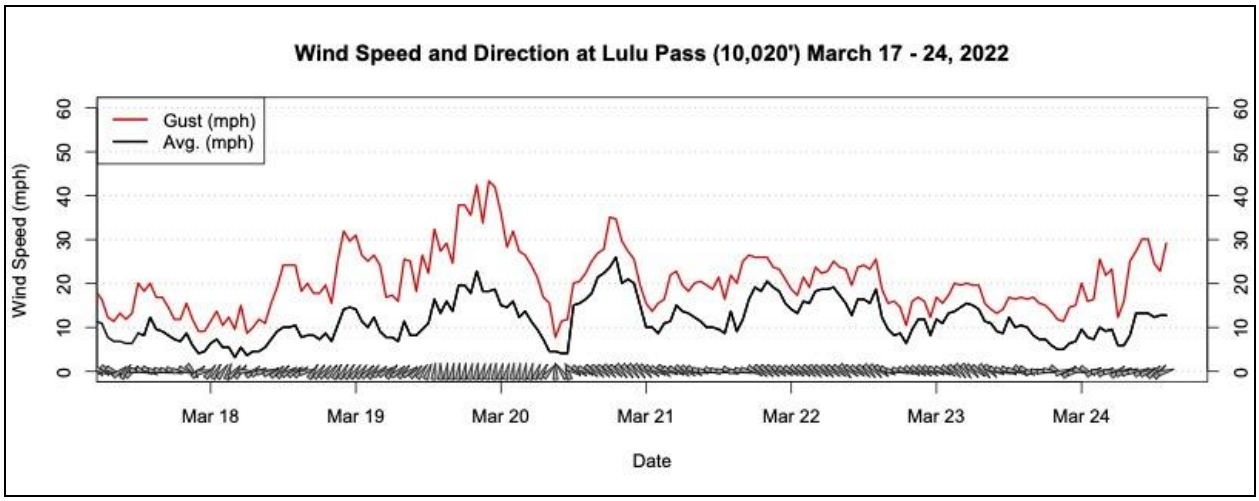

Figure 2. Wind speed and direction (hourly) from Lulu Pass from March 17 to March 24 at 2 pm. Wind direction is displayed as arrows along the bottom of the graph. Wind direction was west-southwest 5-7 days prior, then shifted to the northwest for 3 days, and was west-southwest the day of the accident.

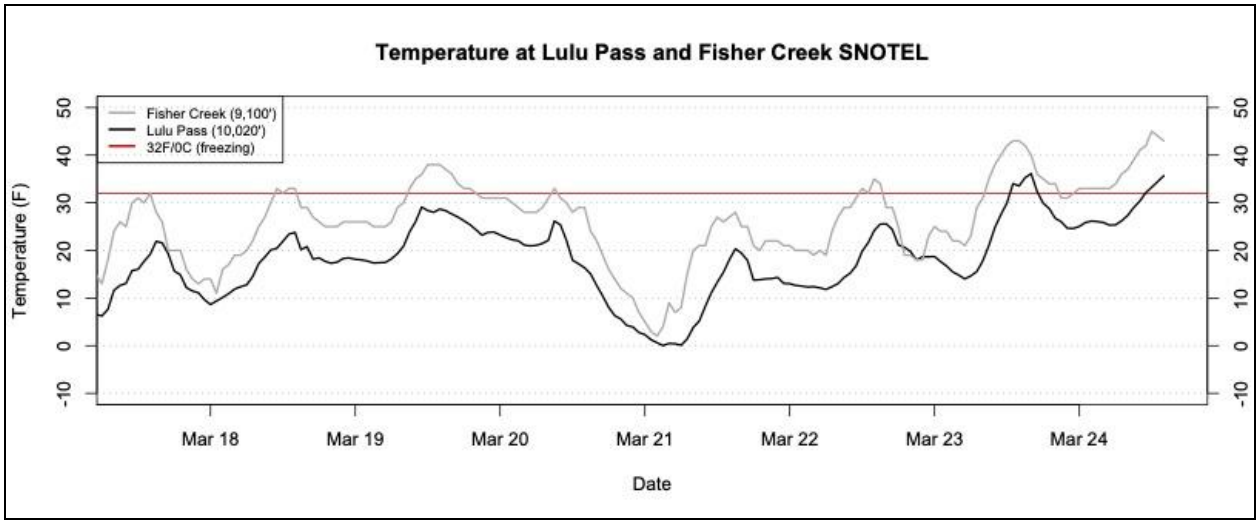

Figure 3. Temperature (hourly) from Lulu Pass weather station (10,020') and Fisher Creek SNOTEL (9,100') from March 17 to March 24 at 2 pm.

SNOWPACK

The avalanche occurred on a west-facing slope at 9,600' elevation. It was a dry slab avalanche classified as HS-ASu-R2-D2.5-O. The group noted the snowpack surface did not refreeze well the previous night, especially at lower elevations. GNFAC forecasters visited the site the day after the avalanche. The avalanche broke an average of 2 feet deep beneath a 1F- to 1F hard slab on a F hard layer of 2mm faceted crystals that formed during high pressure in January and early February (Figure 4). The snowpack at the crown was dry with a 1" thick P- hard melt-freeze crust on the surface, indicating the surface had previously been wet. The slope angle at the crown was 38 degrees, and at the steepest part of the slope where the avalanche was likely triggered it was 40-43 degrees (measured with an inclinometer). We observed a supportable 1-2" melt-freeze crust on the surface of the snowpack at all elevations on aspects that had previously received any sunshine. Shaded slopes above 8,000' still had dry snow on the surface indicating they had not been wet, despite above freezing temperatures the previous day.

The avalanche forecast on March 24 stated:

> *Today, the mountains around Cooke City are not getting as warm or seeing as much sun as the other ranges. Clouds and a breeze will keep the snow surface from getting warm enough to avalanche. In dry snow there is a weak layer of sugary facets a foot or two under the surface. Skiers got two large collapses on this layer in Yellowstone National Park on Barronette Peak which is outside our forecast area (details). It was in a thin, 4 foot deep snowpack, but worth noting since similar conditions could be found in thinner snowpacks around Cooke City. For today, both wet and dry avalanches are unlikely and the danger is rated LOW.*

GNFAC Avalanche Forecast for Thurs. Mar 24, 2022

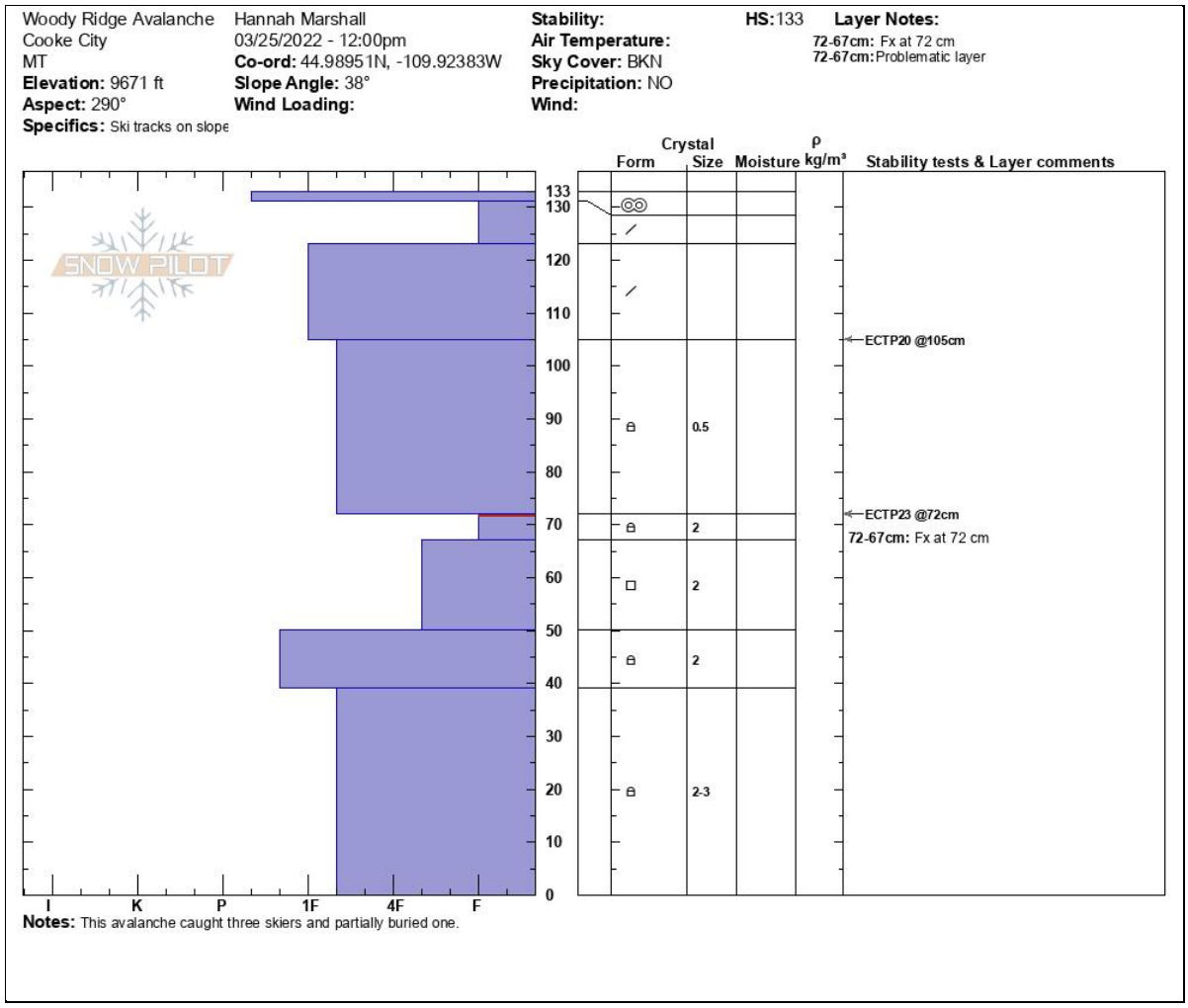

Figure 4. Snowpit profile from the crown of the avalanche. Observed March 25, 2022, the day after the avalanche was triggered.

INVESTIGATION

GNFAC forecasters Alex Marienthal and Dave Zinn, and GNFAC intern Hannah Marshall visited the site the day after the avalanche, March 25, to obtain snowpack and avalanche information. Dave Zinn of the GNFAC obtained details of the event through interviews with group members immediately following the accident and the following day.

Any questions should be directed to:
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