

A final factor to consider is the dramatic temperature rise in the 24 hours before the avalanche. Could that have contributed to the avalanche release? A rising temperature in a dry snowpack affects the slab's stiffness, but does not necessarily make it weaker. In this accident, the rapid loading effects of a significant snowfall (in excess of three feet in the days before December 26) and strong winds causing heavy blowing snow were the primary factors that created a high avalanche danger. Any temperature effect would be strictly a second-order effect.

20000111 **SQUARE TOP, WEST OF CANYONS VILLAGE AT PARK CITY, UTAH** | January 11, 2000

Two sidecountry skiers caught, buried, and killed

WEATHER AND SNOWPACK CONDITIONS

West-to-southwest winds had been blowing in the Wasatch Range of Utah on January 10 and 11. The winds had transported enough recently-fallen snow to load north-through east-facing slopes along the Wasatch crest.

ACCIDENT SUMMARY

On January 11, Park City residents Greg (47) and Loren (41) Mackay were skiing at a resort northeast of Park City that was then named The Canyons (now Canyons Village at Park City). Friends described the husband and wife as very good skiers who looked for powder but never seemed reckless in this pursuit. At about noon that day they were seen at the backcountry access gate near the top of the Ninety-Nine 90 chairlift. There, a ski patroller discouraged them from leaving the ski area that day. The Mackays went anyway.

The couple then skied and hiked about a mile west across a saddle to a 9,770-foot peak that is a popular backcountry location for skiers and snowboarders. The local name for the peak is Square Top. It is steep, with slope angles of 37 to 38 degrees, and is known avalanche terrain. At some point in their descent, they triggered an avalanche that buried them both.

RESCUE SUMMARY

When the Mackays failed to pick up their son Connor (3) from day care on Tuesday afternoon, Sheriff's deputies and several friends began looking for the missing couple. That night, a friend found the Mackays' car in the Canyons parking lot. This find triggered a search of the Canyons' ski terrain through the night, yielding nothing.

The following morning, during a helicopter search of the terrain surrounding the ski area, rescuers saw the avalanche on Square Top, with ski tracks going in and none coming out. About 45 search and rescue volunteers and ski patrollers then went to the site. The rescuers concentrated their search down the fall line from the ski tracks entering the fracture line, but found no visible clues or beacon signals. A probe line began working uphill from the toe of the debris and soon had success.

Searchers first found a ski, then a body, and then, about 20 minutes and 60 feet farther uphill, the second body. Neither body showed obvious signs of trauma, so it appeared death was by suffocation. The woman was buried about 18 inches deep; the man 3.5 feet deep.

AVALANCHE DATA

This avalanche was classified as a HS-ASu-R4-D3. It released on the northeast side of Square Top at an elevation near 9,700 feet, and the slope angle was about 37 degrees. The crown was three to five feet deep and 600 feet wide, and the avalanche fell 1,000 feet vertical. The slide mostly ran on a firm bed surface but gouged into a layer of faceted snow in places.

Deep
Persistent Slab
avalanche

COMMENTS

This sad accident left the couple's 3-year-old son parentless. This couple seemed unaware of the risks they were taking, even after the ski patroller at the backcountry access gate had urged them not to go.

A little avalanche education would have gone a long way here, starting with the attitude that "sidecountry is backcountry." Had the couple abided by the basic rules of safe backcountry skiing, the outcome would have been better, even if the avalanche had still occurred. Specifically, they could have started with 1) having beacons, shovels, and probes and 2) skiing one at a time. If they had followed these two tenets, there would have been one buried victim and one rescuer, instead of two helpless buried victims.

No rescue
equipment

EXTERMINATOR, CRYSTAL MOUNTAIN RESORT,

20000116

WASHINGTON | January 16, 2000

One skier caught, buried, and killed

WEATHER AND SNOWPACK CONDITIONS

Weather conditions at Crystal Mountain in the southern Cascades on Sunday morning, January 16, 2000, could best be described as horrible on the upper mountain and very stormy and windy on the lower mountain. At 06:00, sensors near the top of the Rainier Express Chair at 6,800 feet measured winds at 20 to 30 mph with gusts to 40; by about mid-day, winds there had increased to 30 to 50 mph with gusts to over 70. Wind gusts over 100 mph were also recorded at the break-over tower on Rainier Express around mid-day.

The gale-force winds, along with snowfall and blowing snow, limited the ski patrol's use of chairlifts to access the upper mountain for avalanche hazard mitigation. They had run the High Campbell lift very early in the morning but after that relied on snowcats to transport mitigation teams to the rest of the upper mountain. Despite the extensive avalanche mitigation work, the ski area did not open any of the upper lifts to the public because of the deteriorating weather conditions.

ACCIDENT SUMMARY

At approximately noon, the wind holds for all upper lifts were continuing. Chair 1 (also known as Miner's Basin Lift) ran parallel to the Exterminator run and lifted skiers to a midpoint on the mountain. (Note: Miner's Basin Lift was removed some years later, and the Mount Rainier Gondola now runs on a similar line, but the gondola goes all the way to the summit of the mountain.) A ski patroller stationed near the top of Chair 1 noticed