



Updated October 2020

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NSAA Avalanche Safety Fact Sheet

- The majority of avalanche accidents and near-misses occur in the backcountry (unmitigated, unpatrolled terrain outside of the ski area's boundary).
- In 2019/20, there were four fatalities from two in-bounds avalanche incidents.

Overview

The safety of guests and employees is ski industry's highest value. The industry employs highly-trained snow safety professionals to mitigate the risk of in-bounds avalanches. However, it is possible for avalanches to occur despite their best efforts. Ski area snow safety professionals conduct avalanche mitigation, institute best practices for snow safety and lead public education efforts to reduce the risk of avalanches and of being caught in a slide.

Methodology & Terms

In-bounds avalanches are often reported by ski areas and compiled by local avalanche centers. Data in this fact sheet comes from the [Colorado Avalanche Information Center \(CAIC\)](#), the national clearinghouse for both backcountry and in-bounds avalanches. When speaking about the past 10 seasons of data, we mean data spanning the 2010-11 through 2019-20 winter seasons.

Backcountry: The terrain outside of a ski area's operating boundary. This terrain is not patrolled or mitigated for avalanches. Skiers/snowboarders venturing into this terrain should be equipped with some degree of snow safety education and standard avalanche rescue gear (beacon, shovel, probe). Backcountry travelers should **always** ski or ride with a partner, and should check in with the local avalanche center or ski patrol to learn about current snow conditions.

Sidecountry: This term was used to refer to backcountry terrain that was accessible by a ski area's lifts. However, this term is no longer used in ski industry parlance as it creates a false sense of safety. "Sidecountry" is analogous to "backcountry" in that it refers to terrain that is neither patrolled nor mitigated for avalanches. **We encourage the media and public to avoid use of this term.**

Open terrain: Terrain within a ski area's boundary that is marked as open to the public by the ski area.

Closed terrain: Terrain within a ski area's boundary that is marked as closed to the public. This terrain may or may not have been mitigated for avalanches.

Avalanche terrain: Terrain that is prone to avalanches, with a slope angle generally greater than 30 degrees. This terrain may also be identified by rock outcroppings, a defined lack of trees (indicating years of avalanche activity) or be exacerbated by a "terrain trap" such as a gully or concave topography. However, snow slides and/or sluffs can happen on almost any terrain.

In context

There have been 244 avalanche fatalities in the U.S. in the last 10 ski seasons (since 2010-11), with the vast majority occurring in the backcountry. Of the 244, there were 14 in-bounds avalanche fatalities, with one occurring in closed terrain and one occurring beyond the ski area boundary.¹ There have been in-bounds avalanches at ski areas in the past several seasons that have not resulted in fatalities. Those avalanches are not included in this report. To view CAIC's U.S. fatality statistics by year and location, visit <http://avalanche.state.co.us/accidents/us/>.

Ski area employees accounted for four of those in-bounds fatalities, with avalanches occurring while performing duties associated with their job function. Ski patrollers doing snow safety mitigation at ski areas have been caught in avalanches. However, those incidents do not accurately represent the risk to members of the general skiing public.

CAIC avalanche fatality data includes all methods of travel; skiers and snowboarders; snowmobilers; snowshoers, climbers and hikers; and residents (roof avalanches) are also included in the total avalanche fatality number.

NSAA and snow safety professionals on in-bounds avalanches

Ski areas have implemented continuous and aggressive training and education efforts to help minimize the number of in-bounds avalanche fatalities, including frequent use of explosives to intentionally release unstable snow.² Snow safety professionals work diligently to mitigate the risk of avalanches. However, avalanche mitigation remains an imperfect science, and avalanches remain an inherent risk of skiing.

"Avalanches and snow slides remain an inherent and recurrent risk of skiing and snowboarding, particularly in alpine environments where local weather and snow conditions can change dramatically in minutes," stressed Kelly Pawlak, president of the National Ski Areas Association (NSAA) and the former general manager at Mount Snow Resort in Vermont.

¹ In the 2013/14 season, CAIC lists one fatality as an in-bounds avalanche fatality. However, that fatality did not occur within the boundary of a ski area; it references the death of a ski patroller performing exploratory research 16 miles beyond the ski area boundary. Due to the constraints of the CAIC database, this information was listed as an "in-bounds fatality." You can review the incident [here](#).

² To see a team of ski patrol avalanche professionals at work, [watch this 2013 video](#) from Canyons Ski Resort (now part of Park City Mountain Resort).

“Skiers and snowboarders should educate themselves about the risks involved in recreating in avalanche terrain, and take precautions whenever they’re in avalanche-prone areas,” Pawlak said.

“Ski patrols can minimize the danger to an extremely low level, but they can’t completely eliminate it,” noted Karl Birkeland, PhD., the director of the United States Forest Service Avalanche Center, which monitors avalanche activity in national forests.

“Resorts do a phenomenal job with avalanche mitigation given how few fatalities there have been,” noted Dale Atkins, an avalanche specialist in Avon, Colo., and vice president of the Avalanche Rescue Commission for the International Commission on Alpine Rescue.

Safety tips for travelling in avalanche terrain

Ski areas take proactive steps to provide avalanche safety education to guests and employees, including mountain signage and closures, trail map language, informational videos (such as the Utah Avalanche Center’s [Know Before You Go](#)), and hands-on training in the use of avalanche transceivers.

Individual, personal responsibility remains a hallmark of avalanche precaution and preparedness. NSAA emphasizes that skiers and snowboarders should always ski with at least one partner, and keep those partners within sight. Strict adherence to trail and terrain closures reduces the risk of avalanches. Those who choose to ski extreme terrain should carry avalanche equipment, including transceivers (beacons), probes and shovels, as well as cell or satellite phones. Skiers and snowboarders accessing extreme terrain, as well as backcountry terrain, should ski the slope one at a time, rather than in a group. When headed to avalanche-prone terrain or into the backcountry, skiers and snowboarders should let a trusted individual know where they are going and when they expect to return. Always check with ski patrol to learn what terrain is open or closed and get the local avalanche forecast.

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The National Ski Areas Association (NSAA) is a trade association representing the interests of ski area operators and industry suppliers. Formed in 1962, NSAA designs and supports ski industry initiatives and programs, including growth, safety and sustainability, from its Lakewood, Colo., headquarters. Learn more about NSAA's mission and programs at NSAA.org.