NSAA Avalanche Safety Fact Sheet

LAKEWOOD, Colo. – September 15, 2014 – Despite the best efforts of highly trained ski area professionals, avalanches can occur within the boundaries of ski areas. That said, the overwhelming majority of avalanche accidents occur in the backcountry outside of ski area boundaries. The industry focuses on in-bounds avalanche mitigation, safety, and public education measures to reduce the risk of avalanches and snow slides. As always, safety remains the top priority within the ski industry.

“By the very nature and location of skiing, avalanches remain inherent and recurrent risks within the sport,” stressed Michael Berry, president of the National Ski Areas Association (NSAA). “Skiers and snowboarders need to take precautions and educate themselves about the risks involved when skiing in avalanche-prone areas.”

During the 2013-14 ski season, there were 35 fatalities from avalanches in the United States – all of them occurring in the backcountry, outside of ski area boundaries, according to statistics compiled by NSAA and the Colorado Avalanche Information Center (CAIC). There were zero avalanche fatalities occurring within ski area boundaries at U.S. ski areas last season. At the same time, the number of fatalities occurring within ski area boundaries was down from the 2012-13 season, when there was one guest avalanche-related fatality at a U.S. ski area. (There were also two ski patrollers who died while working during the 2012-13 ski season.) Since 2000, there have been a total of 411 avalanche fatalities in the United States – the overwhelming number occurring in the backcountry – with an average of 29 avalanche fatalities per winter season (see chart, p. 4). To view CAIC’s statistical fatality data, visit http://avalanche.state.co.us/accidents/us/.

CONTACT: Dave Byrd
Director of Risk & Regulatory Affairs
dbyrd@nsaa.org
(720) 963-4213 (office)
(202) 270-3924 (cell)
Despite the risks associated with avalanches, fatalities resulting from avalanches at ski areas in the U.S. are extremely rare. Of the 411 total fatalities in the United States since 2000, 11 of these avalanche fatalities have involved guests skiing or snowboarding within ski area boundaries at U.S. ski areas. In short, 3 percent of all avalanche fatalities since 2000 in the U.S. have occurred to guests skiing or snowboarding in-bounds at U.S. ski areas. Notably, statistics show that there is less than one fatality from in-bounds avalanches at ski areas per 100 million skier visits (see chart).

Avalanche fatalities that occur within the boundary of a ski area are far more rare than those that occur in the backcountry – as more than 97 percent of all avalanche fatalities occur in the backcountry. Going back to 1980, there have been 16 guest fatalities due to in-bounds avalanches at U.S. ski areas, which averages to well below one avalanche fatality every two ski seasons. It should be noted that of these 16 guest fatalities occurring at U.S. ski areas since 1980, one-third of these avalanches were caused by natural-occurring avalanches or caused by other skiers with a different group.

Moreover, according to CAIC’s fatality data, more fatalities occur to individuals who are snowmobiling, climbing, hiking, or showshoeing than to those who are skiing or snowboarding. Since the 2006-07 season, there have been 119 avalanche-related fatalities involving snowmobilers, hikers, climbers, and snowshoers; for skiers and snowboarders, there have been 98 fatalities since the 2006-07 season. Indeed, of the 237 avalanche fatalities since the 2006-07 season (including those of unknown origin), more than 50 percent of all avalanche fatalities involved snowmobilers, hikers, climbers, and snowshoers; 41 percent involved skiers or snowboarders.

NSAA collects data on avalanches to provide the public with information on the true risk of avalanches occurring at ski areas. Without a doubt, industry avalanche experts agree that avalanches, whether in-bounds at a ski area or in the backcountry, are truly an inherent risk in the sport. For calculating fatalities at U.S. ski areas, NSAA includes deaths that occur to guests skiing or snowboarding in-bounds; if a guest skis out of bounds into the backcountry – even if the backcountry was accessed from the ski area – NSAA does not include that as a fatality occurring within a ski area’s boundaries, because this does not reflect the true risk to those skiing or snowboarding in-bounds at a ski area. Furthermore, NSAA does not include deaths of patrollers or other employees at ski areas in its fatality rate calculation, as this also does not reflect the true risk to the skiing public (patrollers conducting avalanche mitigation work, or working with
explosives, have an overall higher risk than the risk facing the skiing public). Indeed, of the three in-bounds fatalities during the 2012-13 season, two of the fatalities were ski patrollers who were killed in avalanches while on the job, but both were in areas closed to the public. In the 2013-14 season, one ski patroller died while working in a backcountry avalanche several miles beyond the ski area’s boundary.

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

“The ability to manage Mother Nature is limited, particularly in alpine environments where local weather conditions can change dramatically in minutes,” emphasized NSAA’s Michael Berry.

Aggressive training and education efforts by ski areas have minimized the number of avalanche fatalities at resorts in the U.S., including frequent use of explosives to intentionally release unstable snow. (Since the late 1950s, there have been far more than 3 million detonations of hand charges to mitigate avalanches in the U.S., according to the American Avalanche Association.) Despite the industry’s solid track record, however, avalanche mitigation is not perfect. As Ethan Greene, PhD., director of the Colorado Avalanche Information Center, points out, such fatalities do occur, despite the fact that the ski areas in which they occur have impressive safety records that span several decades.

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

Each ski season, ski areas pursue snow safety with vigor, taking proactive steps to provide avalanche safety education to guests and employees, including mountain signage and closures, informational videos, 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 should always ski with at least one partner, and keep those partners within sight. Strict adherence to trail and

1 The data collected by CAIC does not distinguish between guests and employees (such as ski patrollers) in terms of how CAIC tabulates in-bounds fatalities at U.S. ski areas. As a result, CAIC’s website includes ski patrol fatalities at U.S. ski areas as in-bounds avalanche fatalities in their total fatality numbers. Again, NSAA only includes fatalities to the skiing public (i.e., guests) at U.S. ski areas, and does not include ski patrol fatalities.
terrain closures can also reduce the risk of avalanches. Those who ski extreme terrain should carry avalanche equipment, including transceivers, reflectors, airbags, and probes and shovels. Skiers and riders accessing extreme terrain – especially when it is first opened for the season or after a large storm, when many avalanches occur – should ski the slope one at a time, rather than in a group. Also, when headed to avalanche-prone terrain or into the backcountry, skiers and riders should always let friends and family know where and when they are going.

Furthermore, ski helmets are effective at limiting injuries. According to medical research, although 75 percent of avalanches deaths are due to asphyxiation or suffocation, 25 percent of avalanche deaths are due to trauma. See Wilderness Medicine, page 56, Dr. Colin Grissom, Dr. Martin Radwin, Dale Atkins, and Dr. Scott McIntosh, 2012.

While there has been an increase in avalanche fatalities at ski areas over the past two decades, most avalanche and industry experts attribute the increase to a combination of unusual weather conditions and recent advancements in ski equipment, as wider skis and all-mountain skis allow easier access to more extreme and steeper terrain on the mountain, increasing the odds of triggering – or becoming caught in – an avalanche or snow slide.

<table>
<thead>
<tr>
<th>SEASON</th>
<th>Total U.S. Avalanche Fatalities*</th>
<th>Total In-Bound Ski Area Guest Fatalities*</th>
<th>SKIER DAYS** (in millions)</th>
<th>FATALITY RATE (per million) In-bounds only</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990-2000</td>
<td>234</td>
<td>1</td>
<td>523.8 (1990-91 – 1999-00)</td>
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<tr>
<td>2000-2010</td>
<td>293</td>
<td>8</td>
<td>635.5 (2000-01 – 2009-10)</td>
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<tr>
<td>2010-2014</td>
<td>118</td>
<td>3</td>
<td>225.0 (2010-11 – 2013-14)</td>
<td>0.013</td>
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* Statistics compiled from data from the Colorado Avalanche Information Center

** Data according to the 2013-14 NSAA Kottke End of Season Survey
Additional Avalanche Information Contacts:

Dr. Ethan Greene, Director of the Colorado Avalanche Information Center  
(303) 499-9650 office  
(303) 204-6027 mobile  
Ethan.Greene@state.co.us  
http://avalanche.state.co.us/acc/accidents_us.php

Brian Lazar, Deputy Director, Colorado Avalanche Information Center  
(303) 618-8996 mobile  
(303) 499-9650 office  
Brian.Lazar@state.co.us

Dr. Karl Birkeland, Director, USDA Forest Service National Avalanche Center  
(406) 587-6954 office  
(406) 579-8667 mobile  
kbirkeand@fs.fed.us

Paul Baugher, Director of Northwest Avalanche Institute, and Director of Ski Patrol,  
Crystal Mountain, Washington  
(253) 508-1898 mobile  
paul@mountainguides.com

Dale Atkins, avalanche specialist, President of the American Avalanche Association and  
Vice President of the Rescue Commission for the International Commission on Alpine  
Rescue  
(303) 579-7292 mobile  
Dale.Atkins@recco.com

THE NATIONAL SKI AREAS ASSOCIATION, LOCATED IN LAKEWOOD, COLO., IS A TRADE  
ASSOCIATION FORMED IN 1962 FOR SKI AREA OWNERS AND OPERATORS NATIONWIDE.

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