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steep in service • deep in information

## 2021 / 2022 Tour Education Guide

Updated November 2020

## TOUR EDUCATION GUIDE

The Mountain Host Tour Education Guide has been completely refreshed this season. We hope that you will find it a useful reference for confidently leading tours.

We need your feedback to enable future improvement of the Tour Education Guide. Your ideas for improvement, comments, and corrections are always welcome. Please send feedback to Grace Perez.

### Table of Contents

.....	1
<b>TABLE OF CONTENTS .....</b>	<b>2</b>
<b>INTRODUCTION.....</b>	<b>3</b>
<i>Introduction to Host Tours .....</i>	<i>3</i>
<i>Tips for Being a Good Tour Guide.....</i>	<i>4</i>
<b>SNOWBIRD FACTS .....</b>	<b>4</b>
<i>Key Figures .....</i>	<i>4</i>
<i>Timeline .....</i>	<i>6</i>
<i>Statistics.....</i>	<i>6</i>
<i>Facilities .....</i>	<i>7</i>
<i>Programs.....</i>	<i>7</i>
<i>Environmental Sustainability .....</i>	<i>8</i>
<i>Geographical Setting .....</i>	<i>9</i>
<i>Tram Basics .....</i>	<i>10</i>
<i>Avalanches and Avalanche Safety ..</i>	<i>11</i>
<i>Backcountry Access .....</i>	<i>13</i>
<b>LITTLE COTTONWOOD CANYON .....</b>	<b>13</b>
<i>History .....</i>	<i>13</i>
<i>Geology .....</i>	<i>14</i>
<i>Flora and Fauna.....</i>	<i>15</i>
<i>Alta Ski Area .....</i>	<i>19</i>
<i>Talking Points: Short Stories, Special Topics &amp; Folklore .....</i>	<i>20</i>
<b>ADDITIONAL BACKGROUND.....</b>	<b>21</b>
<i>The Stories Behind Snowbird Trail Names.....</i>	<i>21</i>
<i>Transitions (2015-2018).....</i>	<i>22</i>
<i>The Luck of the Draw .....</i>	<i>26</i>
<i>The Continual Quest to Improve .....</i>	<i>29</i>
<i>52-Hour Interlodge.....</i>	<i>29</i>
<i>The Uinta-Wasatch-Cache National Forest.....</i>	<i>32</i>
<i>A Geologic Tour of Little Cottonwood Canyon .....</i>	<i>33</i>
<i>For Further Reading .....</i>	<i>33</i>

## INTRODUCTION



***“My underlying dream for Snowbird is the creation of a year-round resort which respects and complements the beauty and inspiration of this natural setting, a place dedicated to increasing human understanding through the enhancement of body, mind and spirit.”*** — Dick Bass

### Introduction to Host Tours

The primary goal of Host-led mountain tours is to provide guests with a personalized welcome and introduction to Snowbird. This introduction can enrich their visit by making it both safer and more enjoyable. While every tour is unique, it's important to ensure some consistency in the facts that are conveyed. Host tour guides (Guides) should therefore include a core set of information on every tour. Guides will tailor additional topics to their own knowledge base and the guests' interests as well as time available, conditions and other constraints.

#### Core Information

Every guest taking a tour should be armed with the information they need to:

1. Navigate their way around the mountain
  - a. the three drainages
  - b. the relative locations of lifts, particularly those they might enjoy after the tour
  - c. the primary routes to use when travelling between drainages
  - d. the fact that anyone with a lift pass may use the tram both up and down
2. Know the locations of essential facilities and any others they identify during their tour
  - a. bathrooms on the mountain, Creekside and in Snowbird Center
  - b. options for food on the mountain and at base facilities
  - c. retail, rental and other facilities they might need based on Guide conversation with guests (e.g., Mountain School, Spa at the Cliff Lodge)
3. Understand Snowbird's unique history
  - a. the mining history of LCC, especially how it relates to the resort (run names, water system, etc.)
  - b. Ted Johnson and Dick Bass
  - c. timeline basics
  - d. current ownership
4. Stay safe on the mountain
  - a. avalanche safety (e.g., staying out of closed areas, delayed openings)
  - b. responsibility code
5. Get further information:
  - a. What's Up at the Bird?
  - b. Snowbird website and new app

Through conversation with tour guests, Guides will determine what additional topics to include or cover in more depth, such as:

- Geographical setting
- Snowbird statistics, programs and facilities
- Tram basics
- The history, geology, flora and fauna of Little Cottonwood Canyon (LCC)
- Snowbird's environmental sustainability program
- Our neighbor, the Alta Ski Area
- Snowbird's future plans
- Personal suggestions for where tour guests may enjoy skiing or riding after their tour

At the end of the tour, Guides should always give guests the opportunity to provide any feedback they may have.

This manual contains most but not all of the above information. What is not here will be covered at the all-host meetings, rookie meetings and during Host Ongoing On Mountain Training.

Please keep in mind that Guides should not feel compelled to commit this entire manual to memory! Hosts are encouraged to familiarize themselves with as much of this as possible so that they may tailor each tour to their participants' interests.

## Tips for Being a Good Tour Guide

(adapted mostly from savingplaces.org/stories/10-tuesday-tips-good-tour-Guide)

**Be personal.** It's good to have a few personal anecdotes to share, even if they're just about past tours you've done. This helps build connections between you and the guests.

**Tell a story (historical or contemporary).** Make sure you have a few fun and compelling stories to tell about the mountain. People are more likely to feel engaged when they are listening to a story, rather than a list of dates and names.

**Face the crowd, not what you're talking about.** Tour Guides can get so wrapped up in pointing out the sights that they forget to face the people they are addressing. This will also make it easier for your guests to hear what you are saying.

**Use your sense of humor.** Long after the facts begin to fade in your guests' minds, the memory of the fun they had will remain. Guests might take a tour for the LCC history, say, but anyone can lose interest when the facts are presented in a dry and humorless way.

**Don't worry about being perfect.** Guests don't expect you to be perfect. Set the stage for human imperfection by acknowledging that people who may know more than you should speak up and share their knowledge with the group. The more interactive the tour is, the better!

**Be energetic, but not so much that you appear insincere.** Tour Guides should maintain an energy level that keeps guests interested and involved throughout the tour. A Guide's low energy will affect the energy levels of your guests.

**Be flexible.** It's what being a Mountain Host is all about! Whether it's snow conditions, visibility, or differing skier abilities – adapt your tour accordingly.

## SNOWBIRD FACTS

### Key Figures

#### Ted Johnson



Ted "Silver Fox" Johnson was the visionary force behind the establishment of Snowbird. He founded Snowbird in 1971 with Richard D. (Dick) Bass.

While working at the Alta Lodge in 1965, Ted Johnson dreamed of a place that would become Snowbird. Having purchased the deed to the Blackjack mining claim at the base of Peruvian Gulch, Johnson hoped to build a lodging complex as an extension of the Alta community. Blackjack was situated such that skiers could not only ski Alta, but also the wide bowls and 2-mile runs of Peruvian Gulch and Gad Valley.

Ted also had the opportunity to buy the Snowbird mining claim adjacent to Blackjack, and he realized that the canyon could handle an entirely new ski resort. Since Ted's assets were limited, he went on a search for operating capital substantial enough to support his dream. After exhausting his options in Utah, Ted decided to expand his search nationwide. He gathered some of his friends and his wife, Wilma, and they filmed their version of a ski movie (with Warren Miller's help). They would side step up the mountain and take turns skiing down. With this ski movie, he went on the road in search of financial partners.

In October of 1969, Johnson met Dick Bass at a party in Vail. Bass, a Texas oilman and rancher, was a member of the Board of Directors at Vail and Aspen and knew the ski industry.

The next week Bass came to Utah and the two hiked into Gad Valley. Bass immediately recognized the wisdom of Johnson's dream. Soon, Bass and Johnson were touring European and U.S. ski areas to get ideas of how to maximize Snowbird's potential. By April 1970, the project was underway.

It cost more financially, spiritually and emotionally to build Snowbird to the standards set by Johnson and Bass than either of them originally planned. In 1974, Johnson sold his share in the resort in order to spend more time with his family. Ted passed away in January 2018 at age 91.

## Dick Bass

Often described as a renaissance man and a visionary, Snowbird founder Dick Bass was one of the ski resort industry's most dynamic and energetic personalities. In his own words, he was born with "blanket curiosity, nonstop verbosity, and hyper-enthusiasm."

Such temperament and outlook have caused him to take a very broad cut at life and have given him great interest and experience in many areas. He also has said that he picked his father very carefully but didn't go quite far enough west... to Fort Worth, Texas – home of the billionaire Bass family. He's the "Bass from Dall-as", as he liked to describe himself. And though his net worth may not stack up to that of the other Basses, he measures his wealth in adventures and in friendships.

Certainly, Snowbird was a giant leap into the unknown for a geologist and rancher who had never developed any real estate or resort projects on his own. As if Snowbird's evolution were not enough for anyone's nervous system, energy and pocketbook, starting in 1981, Dick played hooky from time to time over 4 years to climb the highest peak on each of the 7 continents.



On April 30, 1985, he finally succeeded in his 4th attempt to scale Mt. Everest and he became the first person to reach the 7 continental highs, as well as the oldest by 5 years to summit Everest at age 55. He held this distinction until 1994.

Snowbird was Dick's passion (along with his wife, Alice) and it keeps evolving each year toward his goal of creating a place for the enhancement of the "body, mind and spirit." Just gaze on the mountain from a balcony window in The Cliff Lodge and you can see how well this place mingles with nature and how Dick's dream of the ultimate ski resort is being realized.

Through his many lectures from coast to coast, Dick was a constant inspiration to others. His story is one of overcoming adversity – in business and in life. If you read his book, "Seven Summits" (co-authored with the late Frank Wells and Rick Ridgeway), you can fully appreciate his robust approach to everything he does and his triumphs of the human spirit. (The book is available throughout Snowbird and at major bookstores across the country.)

To have found Dick on the mountain, one would "just listen for a booming voice that is rich with Texas homilies and Shakespearean poetry, and you'll find the man who has taken "...the road less traveled."

## Ian Cumming



In 2014, Ian Cumming and family and the Bass family entered into a majority owner partnership for the future operation and development of Snowbird. The partnership provided continuing direction and funding for major capital improvement projects, including The Summit atop Hidden Peak, a Four Diamond remodel initiative for The Cliff Lodge and the renovation of the Snowbird Center.

"This partnership will enable Snowbird to achieve more rapid growth and even greater benefits for our guests in keeping with our founding perspective and philosophy of providing a year-round destination mountain resort for the enhancement of body, mind, and spirit, with our ever present emphasis on environmental protection and sensitivity," said Richard D. Bass. In addition, Bass felt extremely fortunate to have the Cumming Family join in Snowbird's future, owing to his inability to live and work at Snowbird's altitude because of his advancing age.

"I look forward to working with the Bass Family and the team at Snowbird in providing world-class experiences on and off the mountain," said Ian M. Cumming, an original investor in the Inn at Snowbird. Cumming owned a home at Snowbird and his family has a long history of skiing at Snowbird. "We are very happy to be involved at a place that has so many fond memories for our family," said Cumming.

Ian's leadership provided significant Snowbird improvements including finishing The Summit. After Ian's passing, his son John became Chairman of Snowbird. John also co-founded the family-owned POWDR Corp., "an adventure lifestyle company" based in Utah and consisting of ski resorts and other complimentary adventure lifestyle offerings.

Snowbird enjoys a collaborative, family relationship with POWDR that allows Snowbird to benefit from POWDR's management, capabilities, and strengths while retaining a localized Snowbird guest experience.

## Timeline

1969	Ted Johnson meets Dick Bass
1971	Snowbird opens on December 23 with 3 lifts, the Tram, Lodge at Snowbird and Snowbird Center
1972	The Inn at Snowbird opens
1973	The Cliff Lodge opens
1974	Iron Blosam opens
1986	The expanded Cliff Lodge opens, after three years of construction
1997	Gadzoom opens
1999	Mineral Basin opens
2002	Snowbird/Alta connection opens
2005	New Peruvian Chair Lift and Peruvian Tunnel open (Dec. 2005)
2012	New Little Cloud chair opens
2013	New Gad 2 chair opens
2014	Cumming and Bass families establish partnership to operate Snowbird
2015/2016	Hidden Peak—The Summit building opens 2015. The Cliff Lodge is remodeled
2016	Creekside Lodge is remodeled and expanded. Baby Thunder 'Tube' opens
2018	Snowbird Center major remodel begins. Bridge linking The Cliff Lodge and Snowbird Center opens
2019	SeventyOne – a new restaurant named for year Snowbird opened debuts in The Cliff Lodge

## Statistics

Lifts	Utah's only Aerial Tram plus 10 chairlifts and five "magic carpets" <sup>1</sup> (Baby Thunder Tube, at the west end of the Tube, at entrance to the Ball Park for use by Adaptive Sports, Mineral Basin tunnel, and Chickadee)
Uphill capacity	17,400 skiers and snowboarders per hour
Runs	171, but the Ski Patrol maps includes many more runs and named areas. It is a "ski/ride what you see" mountain
Acreage	2,500 acres
Terrain	27 percent beginner, 38 percent intermediate, 35 percent advanced/expert
Average annual snowfall	Over 500 inches
Terrain park	The Snowbird Terrain Park is located on the lower part of the Big Emma run. It is accessed by the Mid-Gad or Gadzoom lifts
Elevation	The top of resort is 11,000-foot Hidden Peak; the lowest point on the mountain is the bottom of the Baby Thunder chairlift at 7,760 feet
Total vertical drop	3,240 ft.
Longest run	Chip's Run, 2.5 miles
Longest descent	Gad Valley, 3.5 miles
Only Ski Tunnel in North America	The 600 ft. tunnel to Mineral Basin debuted in December, 2005. Inside, it is approximately 12 ft. high, 10 ft. wide. It was built for a cost of \$1.4 million. Skiers and riders glide on a "magic carpet" that lies 325 feet under Gorilla Pass. Apocryphal stories assert that the actual length was cut to 598 ft. because building codes required either special ventilation or emergency exits (depending on who tells it) for tunnels 600 ft. or longer. Inside the tunnel is the Miners Heritage Gallery, with exhibits, photos and artifacts from the early mining days of LCC
Season	Snowbird has the longest season of any resort in Utah, mid-November through mid-May (conditions permitting.) Snowbird has been open several times for skiing on Father's Day and even the Fourth of July
Founder	Ted Johnson
Funder / Longtime Owner	Dick Bass
Current Owner	The Cumming family, owners of the POWDR Corp., holds majority ownership of Snowbird. The Bass family maintains a partial ownership interest. In 1994, John

<sup>1</sup> Freestanding magic carpets are easily moved or taken down. These numbers & locations are accurate as of the writing of this document.

Cumming co-founded the family-owned POWDR, "an adventure lifestyle company." POWDR's website lists 10 ski resorts in the US and Canada in addition to Snowbird

## Facilities

Equipment Rentals	Ski and snowboarding equipment is available at Snowbird Center (Snowbird Sports & Christy Sports); The Cliff Lodge (Cliff Sports); and, Creekside Sports. The Mountain School has limited rentals for guests taking beginner lessons or classes																
Restaurants	<p>Sixteen, ranging from fine dining to burgers and beers.</p> <table> <tbody> <tr><td>The Aerie</td><td>Mid-Gad</td></tr> <tr><td>The Atrium</td><td>The Rendezvous</td></tr> <tr><td>Baked &amp; Brewed</td><td>SeventyOne</td></tr> <tr><td>The Birdfeeder</td><td>The Steak Pit</td></tr> <tr><td>Creekside Café</td><td>The Summit</td></tr> <tr><td>The Forklift</td><td>Tram Car Pizza</td></tr> <tr><td>General Grits</td><td>The Tram Club</td></tr> <tr><td>The Lodge Bistro</td><td>The Wildflower</td></tr> </tbody> </table>	The Aerie	Mid-Gad	The Atrium	The Rendezvous	Baked & Brewed	SeventyOne	The Birdfeeder	The Steak Pit	Creekside Café	The Summit	The Forklift	Tram Car Pizza	General Grits	The Tram Club	The Lodge Bistro	The Wildflower
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Bars	<p>Five. Many food venues also offer alcoholic drinks with food.</p> <table> <tbody> <tr><td>The Aerie</td><td>The Lodge Bistro</td></tr> <tr><td>The Forklift</td><td>SeventyOne</td></tr> <tr><td></td><td>The Wildflower</td></tr> </tbody> </table>	The Aerie	The Lodge Bistro	The Forklift	SeventyOne		The Wildflower										
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Lodging	Four slope side lodges – The Cliff Lodge, Lodge at Snowbird, The Inn and Iron Blosam – offer rooms by the night, week or longer as well as timeshare opportunities. Snowbird offers 882 total rooms																
Spa	The luxurious Cliff Spa on the top two floors of The Cliff Lodge offers a full complement of services provided by a staff of trained massage therapists, facialists and other specialists																
Meetings & Special Events	Snowbird has over 80,000 square feet available for meetings and special events such as weddings, parties and banquets. Facilities and services include world-class lodging, chef inspired dining and catering, conference services and A/V equipment. The Summit building is a favorite location for weddings																
Retail	<p>Fourteen shops throughout resort</p> <table> <tbody> <tr><td>Center Sundries</td><td>General Grits</td></tr> <tr><td>Christy Sports</td><td>Lofty Peaks</td></tr> <tr><td>The Cliff Spa Shop</td><td>Smiley's Mountain Photo</td></tr> <tr><td>Cliff Sports</td><td>Snowbird Sports</td></tr> <tr><td>Cliff Sundries</td><td>The Summit Shop</td></tr> <tr><td>Creekside Sports</td><td>Pipeline</td></tr> <tr><td>Cottonwood Canyons</td><td>Wings</td></tr> <tr><td>Realty</td><td></td></tr> </tbody> </table>	Center Sundries	General Grits	Christy Sports	Lofty Peaks	The Cliff Spa Shop	Smiley's Mountain Photo	Cliff Sports	Snowbird Sports	Cliff Sundries	The Summit Shop	Creekside Sports	Pipeline	Cottonwood Canyons	Wings	Realty	
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Reservations	Snowbird's Central Reservations can handle all travel needs with one call – (800) 453-3000 or (801) 937-8220. For general resort information call (801) 933-2222																
Website	<p><a href="http://www.snowbird.com">www.snowbird.com</a> -- Early in the 2020-21 winter season Snowbird will release a new app for Apple and Android phones. The app will help provide guests with information such as:</p> <ul style="list-style-type: none"> <li>• Real-time lift and trail status, plus lift wait times</li> <li>• Ski-day tracking; guests will be able to see their own locations and those of friends &amp; family on a map</li> <li>• Push notifications with real-time updates and information as needed, improving communications with guests at the resort</li> </ul>																

## Programs

Night Skiing	Night skiing is normally available on Chickadee from December 20 - March 30 on Wednesday, Friday and Saturday nights from 5:30 - 8 pm. Night skiing is complementary for Snowbird lodging guests, season passholders and kids age 6 & under. Lodging guests may obtain a complimentary night skiing ticket by bringing their resort guest card to the SB Center Ticket Office
Snowmaking	Snowmaking systems in Gad Valley, Peruvian Gulch and Mineral Basin allow for access to skiing and riding in the early season

Mountain School	Snowbird's Mountain School, located on the Plaza Deck of SB Center, offers instruction in skiing and snowboarding for children and adults of all levels. In addition to private lessons, the school offers child & youth programs, private guiding, and women's ski camps
Mountain Guides	Snowbird Mountain Guides offers Guided in-bounds and backcountry skiing, snowcat skiing, helicopter skiing, winter scenic helicopter tours, snowshoe tours, and avalanche education. They're located on the Plaza Deck of SB Center
Adaptive Sports	Wasatch Adaptive Sports, located on Level 2 of the Creekside Lodge, provides entry-level through advanced instruction of winter and summer recreational pursuits for individuals with adaptive needs and their families. Details can be found at <a href="http://wasatchadaptivesports.org">wasatchadaptivesports.org</a>
Ski With a Ranger	This complementary program is offered by the Cottonwood Canyons Foundation. Volunteer Naturalist Rangers lead tours on Saturdays and Sundays departing at 1pm from Mid Gad restaurant. These ~45-minute tours use green and blue runs explore themes that change monthly, such as history, water shed, animals, or geology. Please help promote these tours to interested guests and consider taking a tour yourself
Snowmobile Tours	Snowmobile tours are available through Lofty Peaks, located next to General Grits in Snowbird Center

## Environmental Sustainability

From the start, Snowbird has maintained a goal of operating in harmony with the environment. Those plans continue today with a commitment to environmental protection & sustainability id Little Cottonwood Canyon.

Architecture	Since the initial construction until his passing, owner Dick Bass insisted on conservation of trees and streams and designed the resort around existing vegetation and landscape. The construction of Snowbird actually enhanced many of the canyon's environmental standards. When designing Snowbird Center and The Cliff Lodge, mine tailings (which pollute streambeds and surrounding vegetation) were removed, and areas that were strip mined during the early silver boom were revegetated to help beautify the area and prevent erosion. Starting in 1992, natural gas replaced wood burning fire places in all the condominiums and hotel rooms at the resort, setting an environmental standard for ski resorts.
Vegetation and Preservation	In addition to revegetation efforts during the initial construction, Snowbird continues to revegetate using native plants. These require less water to thrive in the alpine environment. Since 1993, Snowbird has planted over 10,000 trees in Little Cottonwood Canyon with the nonprofit organization TreeUtah. Roofs of the buildings in the Snowbird complex were originally sodden to preserve the view from above and to filter roof-trapped water. Many of the ski runs were designed around existing avalanche paths, which were naturally devoid of trees.
Water Quality and Energy	Little Cottonwood Canyon is a designated watershed district, providing Snowbird, Alta and the Salt Lake Valley with much of its culinary (potable) water. A sewer line was constructed at Dick Bass's request, to protect water quality in the canyon and reduce contamination from septic tanks. Snowbird's Wasatch Drain Tunnel, a storage and treatment facility for culinary water, is composed of a series of mining tunnels built in the 1870-1880's, 100 miles in length, that have been cleaned of hazardous mining materials. The storage capacity of these tunnels is 30 million gallons. The project was built to upgrade the overall water quality in Little Cottonwood Canyon. The tunnel has won numerous awards for innovative water storage, operation and maintenance, and environmental impact. A secondary usage for the water is to cool a power plant located in The Cliff Lodge. The power plant generates electricity to the resort, and provides heating and cooling to The Cliff Lodge, then recycles the water back into the creek.
Saving Water & Reducing Plastic	Snowbird's partnership with the "Slow the Flow" program educates guests and employees on water conservation. Pick up a pocket-sized, reusable Protect Our Winters (POW) water bottle or get one free using the R.I.D.E. app. You can refill it anywhere at the resort. Snowbird is working to reduce plastic waste wherever possible, including the elimination of plastic straws.

Snowbird Sustainability	<p>Some recent environmental updates:</p> <ul style="list-style-type: none"> <li>Completed a Greenhouse Gas Inventory, which details our current emissions and set goals for where we want to go in the future.</li> <li>Snowbird's R.I.D.E. app has been updated and is available for both iPhones and Androids. Employees can find friends and coworkers to carpool with, schedules and sign-ups for Departmental and Canyon Transportation vans, and the UTA Ski Bus schedule - with more options offered this season than ever before. "Improve air quality and reduce traffic congestion while earning rewards, such as \$10 S.T.A.R. cards, monthly prizes for top users, including \$100, nights at The Cliff Lodge, and more." Download it and register as an employee at <a href="http://www.snowbird.com/employee-ride">www.snowbird.com/employee-ride</a>.</li> <li>Recycled over 100,000 pounds of glass since we started the program in 2017.</li> <li>Installed FREE Electric Vehicle Charging Stations at the Parking Structure at Entry 4, "allowing you to charge your car while you charge the slopes!"</li> </ul>
Water Quality & Energy	<p>Little Cottonwood Canyon is a designated and protected watershed, providing Snowbird, Alta and Salt Lake Valley with much of its culinary water. Dick Bass helped initiate and construct a sewer line that brings water from Little Cottonwood Canyon to Central Valley Water Treatment Facility, further allowing Snowbird to help protect and preserve high water quality in the canyon. Service Area 3, located across from The Cliff Lodge, is a water treatment facility that cleans drinking water from the Wasatch Drain Tunnel and distributes it throughout Snowbird and part of the Town of Alta. The storage capacity of the tunnel is 30 million gallons, and the treatment facility has won numerous awards for innovative water storage, operation and maintenance, and environmental innovation.</p> <p>Snowbird works closely with the Forest Service to perform cleaning, operation and maintenance to at the bathrooms at the White Pine Trailhead. This partnership provides further watershed protection and services to Little Cottonwood Canyon.</p> <p>The CoGeneration Plant, currently located at The Cliff Lodge, is being reconstructed, updated and improved and relocated next to the Firehouse at Entry 4. Upon completion in a few years, the new CoGeneration Plant will run on Natural Gas and produce 270% more energy and release 79% less total emissions than the current one, and moves Snowbird further away from coal dependency.</p>
Snowbird's Water Supply	<p>Most of the water that falls in the LCC watershed runs down the canyon and is used for drinking water in the greater Salt Lake City area. Some of the water (millions of gallons!) stays in the canyon, stored in underground silver mine caverns and tunnels built in the 1800's. The water is then filtered at Snowbird's own water treatment plant and used at the resort. Water stored in the tunnels is also used for Snowbird's snow making operations.</p>
Environmental Achievements	<p>Snowbird has won numerous awards for environmental achievements, including:</p> <ul style="list-style-type: none"> <li>Outside Online "America's 10 Most Eco-Friendly Ski Resorts" (2018)</li> <li>National Ski Area Association "Hero of Sustainability" winner (2019)</li> <li>National Ski Area Association "Golden Eagle Award" (2007)</li> <li>Environmental Protection Agency's "Environmental Achievement Award" (2007)</li> <li>State of Utah's "Earth Day Award" (2007)</li> <li>Partnered with National Forest Foundation to provide funds for local conservation projects</li> <li>Founding partner of the Cottonwood Canyons Foundation</li> </ul>

## Geographical Setting

Location	Snowbird is located just 6 miles up LCC on the "front" (west-facing) side of the Wasatch Mountains of Utah. Snowbird lies within the Uinta-Wasatch-Cache National Forest. The resort is physically located on a mixture of private and public lands. Broadly speaking, the base village complex and some lift facilities are situated on private "Snowbird" land. The bulk of the skiable/ridable mountain is owned by the Forest Service.
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	Park City is approximately 40 miles from Snowbird by car, although it is only 9.5 miles "as the crow flies." Likewise, Heber City is about 53 miles away by car but only 14 miles as a straight shot from Snowbird.
Nearby Mountain Ranges	The Oquirrh Mountains run north-south along the western edge of the Salt Lake valley. The Uinta Mountains, one of the few major North American mountain ranges running east to west, is located just south of the Utah-Wyoming border.
Accessibility	Located only 29 miles from Salt Lake City International Airport, Snowbird is North America's most accessible alpine resort destination.
Public Transportation	In winter, the Utah Transit Authority (UTA) provides frequent daily bus service ("The Ski Bus") from the SLC valley to Snowbird and Alta. Schedules are at <a href="http://www.rideuta.com/Rider-Tools/Schedules-and-Maps">www.rideuta.com/Rider-Tools/Schedules-and-Maps</a> .
Other Transportation	Several transportation companies offer non-stop shuttles from Salt Lake City International Airport to Snowbird. Uber and Lyft may be available options, depending on conditions.

<b>Nearby Peaks</b>		
	Elevation (Feet)	Notes
Hidden Peak	11,000	Top of the Tram
Baldy	11,068	Peak between Snowbird and Alta
Highest Peak in Utah	13,528	Kings Peak is located in the Ashley National Forest, about 79 miles due east of Salt Lake City (not visible from Snowbird)
American Fork Twins	11,489 & 11,433	West Twin and East Twin, respectively
Pfeifferhorn (Little Matterhorn)	11,326	Triangular peak looking west from Hidden Peak
Devil's Castle	10,920	In Alta, appears as two rabbit ears looking east from Hidden Peak
Superior	11,050	North side of the canyon, across from the top of the tram
Monte Cristo	11,132	Just west of Superior
Dromedary	11,107	Peak to the west of Monte Cristo
Salt Lake Twins (Broads Fork Twin Peaks)	11,328 & 11,330	North side of the canyon, last peaks to the west on the ridge line

## Tram Basics



**The Snowbird Tram** by Walt McConnell, M.D., is the definitive book, from history and lore to the technical details. This is also the source much of the information below.

General Specs	Cost: \$3 million (approximately \$19 million in 2020 dollars) Manufacturer: Garaventa A.G. Horsepower: 1,750 HP Vertical Rise: 2,900 Feet Base Elevation: 8,100 Feet Cable length: 1.6 miles Winter Time to Peak: 6 minutes Summer Time to Peak: 10 minutes Capacity of 125, although max capacity in Winter is usually limited to 100 Cabin Weight: 7,500 lbs. (without water tank under blue car) Counterweight: 170 tons
Towers	There are four Tram towers: Tower 1: above Rothman Way (a.k.a., Tower 1 Road), Towers 2 & 3: between Think Young (formerly Anderson's Hill) and the lower end of the Cirque, Tower 4: on the crest of Hidden Peak. Towers 1 and 4 have wind speed sensors
How it works	Ever notice that the only time you see both tram cars next to each other during normal operations is roughly half way up the mountain as they pass on their trips up and down the mountain? That's because they are connected by a single haul cable

	which forms a loop. When one car is at Hidden Peak, the other is at Snowbird Center. When the drive mechanism is activated, the car at the top begins moving down as the other begins to move up. Each car is permanently attached (fixed) to the haul cable, which moves up or down the mountain. The cars ride along two track cables much like a train rides along two railroad tracks (look for the wheels above each tram car). The track cables are connected to 170-ton counterweights
Back-Up Motor	During a power failure a back-up diesel engine driving a generator that produces AC for the tram is used. This is slow, with a full trip up or down taking 45 minutes
Evacuation	There are three options: 1) An auxiliary motor can return trams to their docks; 2) Passengers fitted by Patrol with a harness can be lowered by rope through the floor using a winch system; 3) A separate rescue car that holds 14 people plus an operator can be used to offload guests through end windows

## Avalanches and Avalanche Safety

Avalanches and their mitigation play a key role in Snowbird operations and road access to the resort. Snowbird's Patrol is in charge of mitigating avalanche danger inside the resort. Together with Alta and UDOT, Snowbird works to keep the canyon safe for guests.

For Hosts, some of the most challenging days at Snowbird are during or immediately after major snowstorms. The road may be temporarily closed and lifts may remain closed or experience delayed openings. Entire parts of the mountain sometimes remain closed for one or more days. Mountain Tours may be cancelled or, more commonly, restricted in scope.

These factors have a clear impact on the guest experience, and while this can be a negative it is also a great opportunity for Guides to educate them on what lies behind the obvious inconveniences.



## The Road

Little Cottonwood Canyon Road (SR 210) is one of the most avalanche-prone roads in North America. In the 13.6 miles inside the canyon, 64 avalanche paths cross the road. The Highway Avalanche Hazard Index was developed to quantify the potential threat from avalanches. Factors including snowfall, terrain steepness and traffic volume are used to develop a road's rating. According to a presentation by Liam Fitzgerald, UDOT's Avalanche Forecaster, Red Mountain Pass in Colorado has a rating of 126, Rogers Pass in Canada is rated at 174 and Little Cottonwood Canyon Road is rated at 766!

From UDOT's blog.udot.utah.gov:

*"Little Cottonwood Canyon has in part been shaped by avalanches. Avalanches influence vegetation patterns and in turn, vegetation influences erosion patterns forming gullies. Gullies then direct debris further influencing tree growth. Terrain in different parts of the canyon leads to different types of avalanche problems."*

*"Some terrain is very steep and rugged which results in more frequent avalanches usually involving more recently deposited layers of snow. In other sections of the canyon where terrain is more open and less steep, fewer avalanches tend to occur but those occurrences often involve older layers of snow and may cover a wider area."*

*"Although most of the time avalanche forecasting and control efforts allow for safe travel on the canyon roads, upon occasion, naturally occurring avalanches reach the canyon roads while they are open."*

For a fascinating look at a recent storm cycle in LCC that produced multiple massive avalanches, please read the article titled "52-Hour-Interlude" by Adam Fehr in The Additional Background section of this document.

## The Tools

Military artillery was first used for avalanche control work in the United States in 1949, when Alta Snow Ranger Monty Atwater and the Utah National Guard fired a howitzer (a type of cannon with a short barrel) at the Alta Ski Area. Howitzers are still used in LCC today, with several sited within the canyon. Snowbird stations Hosts near the top of the Gadzoom lift to answer questions and keep guests safe when the howitzer (specifically, an M101-A1 105 Howitzer) at Snowbird is fired northward over skiers, structures and the canyon road.

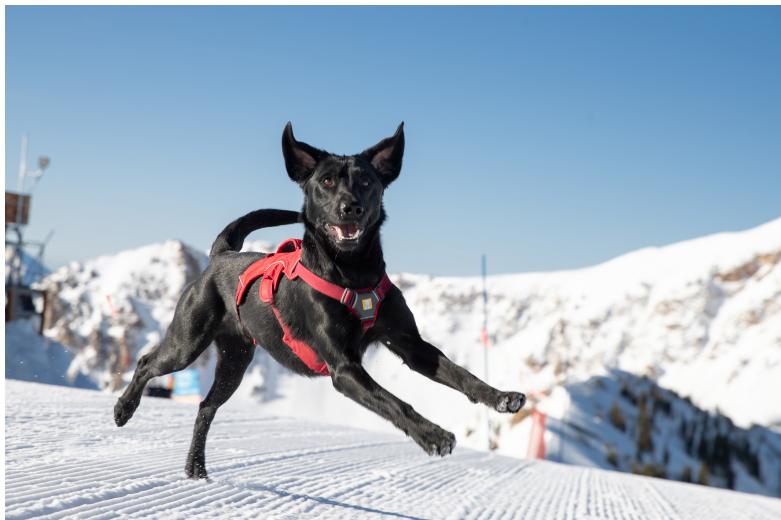
Snowbird patrol uses a combination of techniques to keep the area safe for guests. This requires patrollers to work defined “routes” to make sure areas prone to slides are safe, usually by doing “ski cuts” of the slopes (skiing in long traversing zig-zags, with the possibility of triggering a slide.) The goal is to understand the stability of the snowpack, which can vary depending on orientation, steepness, temperature and other factors. Patrollers throw hand charges (bombs) or place them in key places to trigger avalanches while the resort (or that part of it) is closed. If an area is determined to be at risk for a slide it will remain closed until the proper mitigation takes place. This process takes time. Sometimes, a part of the mountain must remain closed until the storm is over, allowing the snow to naturally settle before further investigation and mitigation take place.

In short, all this effort has only one goal: to keep Snowbird guests safe. But this can only work if they stay out of closed areas. Perhaps the most important thing to stress to guests is that they must respect closed area signs. To do otherwise means not only increased danger to themselves, but also for any Patrol who have to enter the area to relocate them.

While the vast majority of avalanches within Snowbird are deliberately triggered when guests are not present, slides have happened while the resort was open. In 2008 27-year-old Salt Lake resident Heather Gross was killed by an avalanche while skiing inbounds in a hike-to area on Baldy. Another in-bounds avalanche occurred in the Blackjack area in 2012. A snowboarder sustained non-life-threatening injuries from that slide. For obvious reasons, this information is not something that a Guide is likely to share spontaneously during a tour, but is included here in case the question is posed by a guest.

#### **Snowbird's Avalanche Rescue Dogs**

(Sources: Margie Van Komen, Snowbird Ski Patrol; [www.wbrescue.org](http://www.wbrescue.org))



*Snowbird's Frankie.*

Rescue dogs have been used by the Snowbird Ski Patrol since the late 1970's to locate missing or buried skiers/riders after an avalanche. The resort has owned its own rescue dogs since 1990.

Each rescue dog has a primary, secondary and tertiary handler. In fact, the entire Patrol has the ability to transport and set a dog searching. This is because any Patrol person may need to respond to a rescue.

For the 2020-21 season Snowbird has five avalanche rescue dogs: Frankie, Marty, Gator, Gus and Mabel. At eight months old as of November 2020, Mabel is the youngest dog on the team. Snowbird's oldest dog, Trailer, will not be returning to work due to a serious injury he suffered last season. The accident involved a skiing guest, who was unhurt. For the safety of both dogs and guests, Guides should stress that they stay well away from any dog they see while skiing/riding on the mountain.

Each rescue dog will typically work from five to seven days a week during the winter. In reality, most of their work day is spent simply hanging out and waiting; they must be “fresh” for any emergency that requires their service. Even though dogs are usually in the Patrol office throughout the season, Patrol asks that Hosts do not encourage guests to drop by to see them. Alternatives for guests who would like to meet the dogs will be provided at the all-Host meeting.

While Snowbird's dogs are used in avalanche rescues, they take part in search and rescue operations year-round. Work outside of Snowbird (in any season) is carried out through Wasatch Backcountry Rescue, a nonprofit organization that works under the direction of five Wasatch Front County Sheriff's Search and Rescue divisions.

## Backcountry Access

Snowbird Ski Patrol manages gates that allow skiers & riders to leave the resort and enter backcountry terrain. This is referred to as "ski touring." The gates are open only when Patrol deems conditions are appropriate, however, the areas outside Snowbird are not "patrolled" nor are they subject to avalanche control work. Thus, going out of bounds requires that skiers/riders be responsible for their own safety. They should have the ability to assess the snowpack, be aware of weather conditions, and understand how these factors might affect their choices.

Skiers and riders must check in with Ski Patrol prior to leaving the resort via a touring gate. They must also carry the proper equipment (avalanche beacon, shovel and probe) and should be in groups of at least two people.



The daily morning report that Patrol provides on the Host radio channel typically includes whether or not "touring is open," i.e., when the gates are open for use.

Gates are found at the top of the Gad 2 lift for access towards the west, including Scottie's Bowl and White Pine; off Hidden Peak on the uphill side of the Road to Provo toward the Twin Peaks and Pipeline, and out of the lowest part of Mineral Basin.

## LITTLE COTTONWOOD CANYON

### History

(Sources: previous tour education materials, <http://www.miningartifacts.org/Utah-Mines.html>, [www.miningutah.com](http://www.miningutah.com), [en.wikipedia.org/wiki/Little\\_Cottonwood\\_Creek\\_\(Salt\\_Lake\\_County,\\_Utah\)](http://en.wikipedia.org/wiki/Little_Cottonwood_Creek_(Salt_Lake_County,_Utah)), [westernmininghistory.com](http://westernmininghistory.com))

Silver Boom to Ski Boom	<p>Utah's history of mining dates back to an 1863 claim in the Bingham Canyon area of the Oquirrh Mountains. This encouraged further exploration. Discoveries soon followed in Tooele County and in Little Cottonwood Canyon in 1864. The first formal mining operation in LCC began with the Emma Mine and several others in 1865. The new transcontinental railroad in 1869 provided the transportation network to develop Utah's mining efforts from small-scale activity to larger commercial scale. LCC yielded principally silver and lead, although copper, gold and zinc were also found.</p> <p>At its peak in 1873, 8,000 residents lived in the mining town of Alta, which had approximately 180 buildings. Goldminer's Daughter and The Bucket of Blood were among the town's 26 popular saloons. Production of silver ore peaked and then steadily declined by the late 1920's, to be met with the fate of the great crash on Wall Street.</p> <p>A narrow-gauge railroad was completed to Alta. The train was pulled up by mules that then coasted back down, with the brakeman trying to control the wild descent down to the base.</p> <p>In 1938 the first ski lift, Collins Lift, was constructed out of material from old aerial mining trams, and was built on land donated by Alta's Mayor George Watson.</p>
Emma Mine	<p>Silver ore was discovered just above the Town of Alta in 1868 by two men named Woodman and Chisholm. They christened their location "Emma", named for a woman whom one of them had been "consorting in San Francisco – his paramour, in fact." The Snowbird run "Big Emma" was named after this claim.</p> <p>According to the Treasure House Relics Project (<a href="http://miningutah.com">miningutah.com</a>), "Emma is the most famous, and most infamous mine in all of Utah history." British investors paid approximately \$5,000,000 dollars for it. A short time later in 1873, the vein was lost and the investors accused mine managers of fraud. The governments of both countries were drawn into the drama. A vein was subsequently found 300 feet below the original, on the other side of a fault line. The Emma mine closed in 1918.</p>

	having produced close to \$4 million in silver ore. Today the tunnel leads to the water source for the town of Alta.
Mail Tunnel	To transport mail between Big Cottonwood and Little Cottonwood Canyons, a tunnel was used. A donkey was sent on his way back and forth, without a rider.
Peruvian Gulch	Peruvian Gulch takes its name from the Peruvian Lode, which was discovered there in June 1870 by James Wall and associates. One year later, the Peruvian Gulch name was in use. Wall worked the mine sporadically for many years, and he was still at it in 1892. However, the Peruvian was a fairly small producer. In a 1902 estimate, it was suggested that the mine had generated only \$50,000 in ore during all its years of operation. The gulch Hosted many other claims, including a group of six at this upper end, under the Bullion Divide, the ridge between Mount Baldy and the American Fork Twin Peaks. They were known as Iron Blosam Numbers 1 through 6.
Mt. Superior	Named for the Superior Lode (mineral deposit), located on the east side of Superior Gulch. The mine gave its name to the gulch and the mountain above. The great concave face is one of the major avalanche paths in LCC.
Harpers Ferry	Named after a mine and tunnel in the same area.
Gold Mine	During the peak of the mining fever days, a gold mine was established north of the mouth of Little Cottonwood Canyon. Prospectors mined there, but it's believed that not much gold was actually found.
Mineral Basin	Appropriately named after the mines found in the area. Wooden pipes from the old mining days can still be seen carrying water. In the summer they are visible near the path taken by snowmobiles during the winter. Old mine dumps and tailings can also be seen when looking across Mineral Basin facing southeast from the Mineral Basin tunnel exit.
First Aerial Tram, mid 1800s	The first aerial tram in Little Cottonwood Canyon was actually built in the mid-1800's. It ran from Michigan City down to Tanner's Flat. Michigan City was located in Grizzly Gulch, east and a bit north of Alta – a distance of about 4-5 miles. The tram was powered by the weight of the ore placed in the downward buckets. Tanner's Flat was a key station in the mining days. This is typically where the snow would transition between heavy and light snow, causing a variation in the means of transportation. The tram was originally built by the Continental-Alta Company, and then later rebuilt by the Michigan-Utah Company. The flat got its name from the Nathan Tanner family, who posted 2 claims and owned an inn in the area. In September 1872, the inn caught fire and left the Tanner family destitute. They apparently left the area at this time, for no other records are found of them after this time.  <u>This aerial tram served as the source for building material for the first ski lift at Alta, the Collins Lift.</u>
Before the Forest Service... Avalanches	In 1902, prior to and as part of a study for the formation of the Forest Service (1905), a survey was conducted of upper Little and Big Cottonwood Canyons. The surveyors reported "that you would be hard pressed to find a stick big enough to beat a snake." Miners, in search of timber for both housing and support structures for the mines, had stripped the hills of the trees which helped resist avalanches. After one avalanche, town of Alta officials decided that running the main streets north-south would be better protection against avalanches. Not surprisingly, the avalanches didn't seem to realize the change.  Most of the trees in the canyon today came from the 106-acre Wasatch Nursery, established on the site of today's Spruces Campground in Big Cottonwood Canyon to begin post-mining reforestation of the mountainsides around Salt Lake Valley.
LCC's Railroad	A narrow gauge railway was built in 1916 up to Tanner's Flats. From there an aerial tram joined the rail system to Alta. By 1919 the railway extended all the way up the canyon.  Just west of Snowbird, on the north side of the road are the last remnants of a rock wall built to protect the railroad from avalanches and snowstorms. This structure is referred to as the "Chinaman's Wall," for the ethnicity of the workers who built it.

## Geology

Snowbird Geology, Glacial Origins	From 600 million to 3.5 billion years ago, the Great Basin, now called the Wasatch Front, was covered by an inland sea, Lake Bonneville. With the rising and subsiding of the sea, hundreds of feet of sediment were laid down and solidified into bedrock and rock formations.  65 million years ago, our Wasatch Mountains were uplifted, while the Salt Lake Valley subsided. The landscapes where Snowbird and Alta are now located were twisted and warped, folded and faulted. Many gravity faults were formed, the largest being the Wasatch Fault, running north to south for hundreds of miles and visible at the mouth of Little Cottonwood Canyon. The Wasatch
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	<p>Fault is considered one of the major faults in the U.S. Salt Lake City and the surrounding areas, which border the fault, are classified as third-class seismic zones, along with San Francisco and Los Angeles.</p> <p>18 thousand to 3 million years ago, glacial activity carved and shaped Little Cottonwood Canyon, leaving hanging valleys and lakes along the south side of the canyon. A hanging valley is a shallow valley carved by a small glacier and thus the elevation of the valley floor is "hanging" high above the elevation of the valley floor carved out by the larger glacier. Albion Basin and Cecret Lake, White Pine and White Pine Lake, and Red Pine and Red Pine Lake are among the many that were created.</p> <p>Looking west down the canyon, the U-shaped smooth granite walls that resulted from glacial activity turn to a V-shape at the mouth of the canyon from stream cutting action. Hiking or driving the canyon, one can see large smooth boulders left teetering in precarious positions by the receding glacier.</p> <p>The Pfeifferhorn Peak in the distance, facing the southwest, is similar in shape to the Matterhorn in Switzerland; both have three distinct sloping faces, cut by three separate glaciers.</p>
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## Flora and Fauna

Common Trees <sup>2</sup>		
Engelmann Spruce <i>Picea engelmannii</i>		<p>Engelmann spruce is a large tree, averaging 30 inches in diameter and 90 feet in height. At very high elevations, the crown becomes distorted or the whole tree may be low and shrubby in appearance. The needles are about one inch long. They are thin and sharp like other spruce trees and stick out all around the twig like a bottle brush. You can easily identify spruce trees by touching their sharp needles. Also, spruce needles are unique in growing from short, woody pegs that remain after the needles fall off.</p> <p>Other common names: Silver spruce, white spruce, and mountain spruce. They can be seen west of the Summit building.</p>  
Subalpine Fir <i>Abies lasiocarpa</i>		<p>Subalpine fir often grows at the timberline, where it is easily recognized by the narrow spire shape of its upper branches, a clear adaptation to heavy snowfall. The needles are 1-1/2 inches long and curve upward in a uniform manner. They have white lines on both sides, two on one side and one on the other. The purple cones sit upright on the branch and fall apart at maturity, leaving a cone core spike on the branch. They can also be seen west of the Summit building. (Other common names: alpine fir, white fir, balsam fir, and Rocky Mountain fir.)</p>  

<sup>2</sup> extension.usu.edu, en.wikipedia.org, http://nwconifers.com

Rocky Mountain Juniper <i>Juniperus scopulorum</i>		<p>Rocky Mountain juniper can be a shrub or small tree, growing 3 to 30 feet tall. Branches split near the ground. Opposite, scale-like, and small (about 1/16 to 1/8 inch long). Twigs are slender and scaly, being flattened at first, then becoming round. The cones form small, soft, juicy berries that are blue and coated with a white film. It is found between 5,000 and 9,000 feet elevation. Also called Rocky Mountain Cedar.</p>  
Lodgepole Pine <i>Pinus contorta</i>		<p>Known for its long, slender trunks and high, thin crowns, they tend to grow above 6,000 ft. The average mature size is 24 inches in diameter and 70 feet high. Leaves have 2 needles per bundle, approximately 3 in. long. Both male and female cones are found on the same tree, but are separate. The male cones are in large, orange-red clusters. The seed (female) cones are yellow-brown in color and average about 1 ½ inches long. The cones often remain unopened and on the tree until exposed to fire. Because of their very straight poles, these trees were used for construction. Final photo shows female cones on left and male cones on right.</p> 
Limber Pine <i>Pinus flexilis</i>		<p>A small to medium sized high elevation tree, averaging 20 inches in diameter and 40 feet tall. It can grow to 60 ft. but is often shorter and contorted. Found up to 11,000 ft. Leaves are needle-like in bundles of five, 1 ½ to 3 inches long, stout, rigid, and curved. They are so flexible that they can often be tied in a knot without breaking. Male flowers are small, reddish cone-like structures, while female flowers are large woody cones, about 6 inches long. Both cone types are separate but found on the same tree. Their "pine nuts" (1/3 inch long) are a food source for both birds and rodents. Also called Rocky Mountain pine, white pine, limbertwig.</p>  

Blue Spruce ( <i>Picea pungens</i> )		Blue spruce are easily identified by the distinctive blue needles. In the Wasatch Mtns. they are found between 6,000 to 11,000 feet. They grow 70-100 ft tall, trunks 18-36" in diameter. Was designated the state tree of Utah in 1933 but was replaced in 2014 by quaking aspen.
		

Common Animals <sup>3</sup>		
American Pika		This small herbivore is about the size of a rat. They are brown, with flat ears. Pikas live mostly in rocky, alpine areas. They eat grasses, and store their food in hay piles. They have been seen sunning themselves on the rocks near the peak. A recent USGS study found that pikas are disappearing from some locations across the West due to climate change.
Rocky Mountain Goat		Introduced into the area in 1967, they are pure white year-round and live on high rocky ridges. They eat alpine grass, forbs and mountain brush. In the past, one lived one beneath Tram Tower 4 at the base of the cliffs.
Moose		The largest member of the deer family. Unlike other members, most adult males have distinctive broad, palmate ("open-hand shaped") antlers. Moose are seen singly or in small groups. They like to feed on aquatic vegetation and new woody growth during the spring and summer. During the winter, these herbivores eat a diet of bark and twigs from evergreen and deciduous trees. Adults weigh 800–1,200 lbs. Bulls stand 6 ft. tall at the shoulder. Moose are commonly seen during the summer mainly around The Cliff Lodge, Snowbird Center, and on-mountain at Alta and Snowbird.
Mule Deer		The most common of the big game mammals here. They have large ears and a black tipped tail. In summer they are reddish and in winter, have a blue grey coat. They live in forested areas; eat shrubs, twigs, grasses and herbs. In the past, they have been seen at the base of the Cirque, between Tram Towers 3 & 4 and around Snowbird Center.
Uinta Ground Squirrel (Pot Gut)		Pot Gut is the local term for one of the most common mammals at Snowbird, living at all elevations. They are small, roundish and brown, with small ears. They eat green vegetation and seeds. They beg and seem friendly, but do bite! They hate badgers (see below.)

Ermine (Stoat)		Relatively common in Utah. Prefers heavily wooded areas along streams. Individuals are mainly active at night, and they may stay beneath the surface of the snow during much of the winter. Ermine dens can be found in hollow logs, in burrows, and under logs, roots, or rocks. Their diet is composed primarily of small rodents, although insects, birds, and other animals are also eaten. Ermine are brown with white bellies during the summer, but are almost completely white during the winter. In winter they are occasionally seen towards the bottom of Snowbird.	
Grey Squirrel		The eastern gray squirrel has been introduced to, and thrives in this area. Its body ranges from 9 to almost 12 inches, the tail from 7.5 to 10 inches. Their nests are called dreys and can be seen in trees, build from sticks and leaves wrapped with long strands of grass.	
Rock Squirrel		The rock squirrel belongs to the ground squirrel family, but it can be seen climbing boulders, rocks, and trees. It is typically 17-21 inches long, with a tail length up to 8 inches—almost half the length of its body. Rock squirrels are grayish-brown, with some patches of cinnamon brown color. They use large rocks as lookouts to scan for predators or other dangers, warning their kin with loud whistles or chirps that can be confused with bird calls.	
Red Squirrel		A small tree squirrel common to the forests of Utah. They are usually rather loud, and are often heard in Utah's forest areas. Red squirrels usually nest in trees, most often in tree cavities, but leaf nests are sometimes constructed on tree branches. The species eats nuts, seeds, fruits, fungi, and occasionally even small animals.	
Chipmunk		Very small, grayish, live in trees and rocks, also seen west of the Summit building, on the rocks.	
Porcupine		They are bigger than a bowling ball, tan with accents of gold or silver and covered with 30,000 quills. Often friendly. A porcupine dubbed Larry is a regular at the Steak Pit (no doubt due to the fine dining there.) During the 2018-19 season a porcupine was often seen by skiers & riders sleeping in a tree next to Creek Road.	
Badger		Heavy body, short legs, yellowish grey with white stripe from nose to mid back. They live in the grasslands around Snowbird Center. They dig out small rodents for food and love Uinta Ground Squirrels.	

Golden Eagle		They have extremely long wings in relation to their body, are dark golden in color and feed on small animals. They can be seen circling around Regulator Johnson, Mt. Baldy and the Twins looking for prey.
Red-tailed Hawk		Reddish tail and resembles an eagle in flight. They have large broad shoulders and are more compact than an eagle.
Coyote		Also known as the American jackal or the prairie wolf. Typically seen in the early morning or evening.
Occasionally sighted:		Mountain lion (cougar), bobcat, raccoon, black bear.



Coyote Tracks

## Alta Ski Area

Lifts	Three high speed quads (Collins, Sugarloaf and Supreme); one high speed triple (Sunnyside); two doubles (Albion & Wildcat), and; five surface lifts (some to access lodges)
Uphill capacity	Not disclosed
Runs	119
Skiable acres	2,614 acres
Terrain	15 percent beginner, 30 percent intermediate, 55 percent advanced
Elevation	The top of resort is at 11,068 ft.; the lowest point is at 8,530 ft.
Total vertical	2538 ft.
Average annual snowfall	547"

Just one mile east of Snowbird, at the end of Little Cottonwood Canyon, lies the Alta Ski Area. Alta was one of the first ski areas to open in the United States and the second in the western U.S., after Sun Valley, ID. It was officially designated a ski area in 1938, when a group of local businessmen raised \$10,000 for the project.

The slopes of Alta Ski Area were hand-selected by the famous Norwegian skier, Alf Engen. Alf was hired by the Forest Service to determine the area's potential as a winter sports site. The Forest Service saw the deep snow and inviting slopes as a way to create jobs while revegetating the barren Wasatch Mountains, left barren after decades of mining and environmental neglect.

Alta's original lift, a single chair designated Collins (now a high-speed quad), the Watson Shelter and Alta Lodge opened on Jan. 15, 1939. The original lift was driven by an old mining conveyor purchased from the Michigan-Utah Mine and cost skiers 25 cents per lift ride (equal to \$4.59 in 2020 dollars).

Alta is a "skier's mountain." It's one of only three areas in the United States that do not allow snowboarding. (The others are Mad River Glen in Vermont and Deer Valley, UT.) Alta has banned snowboarding since the sport was invented. In 2014 this policy was challenged by the nonprofit organization Wasatch Equality "and four snowboarders," who argued that the ban violated the Equal Protection Clause of the U.S. Constitution. Because Alta is largely situated on US Forest Service land (the land is leased to the ski area), it did not have the right to prohibit or single out a certain type of user's access to federal public land that's supposed to be open to everyone. A federal appeals court upheld the resort's snowboarding ban in 2016, concluding that "Alta had a right to enforce its policy because the U.S. Forest Service didn't influence the decision and therefore it wasn't a blanket 'state action' that could have amounted to discrimination."<sup>4</sup> (The full decision is at [www.ca10.uscourts.gov/opinions/14/14-4152.pdf](http://www.ca10.uscourts.gov/opinions/14/14-4152.pdf).)

<sup>4</sup> [www.npr.org/sections/thetwo-way/2016/04/19/474878983/court-upholds-snowboarding-ban-at-utah-ski-resort](http://www.npr.org/sections/thetwo-way/2016/04/19/474878983/court-upholds-snowboarding-ban-at-utah-ski-resort)

Although snowboarders are not allowed on any Alta lifts, it is not uncommon to hear stories of them entering Alta from Snowbird from the High Baldy Traverse. They begin their ride down on Baldy Shoulder and head towards the Wildcat Base. They can (in theory) use Keyhole or Westward Ho to return to Snowbird, but they are more likely to opt out of that painful traversing experience and return via car or bus. It has been reported that these boarders are avidly jeered at by Alta skiers.

During the 2001-2002 ski season, Snowbird and Alta partnered to offer a lift ticket and season pass that gave access to both resorts. For the first time, skiers had access to a total of 4,700 acres of skiing terrain and 26 chairlifts. Since this combo move, Alta-Snowbird has won many awards for the breadth and quality of available skiing.

## Talking Points: Short Stories, Special Topics & Folklore

Oquirrh Mountains and the Bingham Canyon Mine (a.k.a., Kennecott Copper Mine)	<p>Looking due west and down the canyon across the Salt Lake Valley is the Oquirrh Mountain Range. The light-colored horizontal ridges are the Bingham Canyon Mine, commonly known as the Kennecott Copper Mine. It is owned by Rio Tinto Group, an Australian-British multinational and one of the world's largest metals and mining corporations.</p> <p>Bingham Canyon is (per Wikipedia) "the largest man-made excavation, and deepest open-pit mine in the world." The pit covers 1,900 acres, is 2.5 miles wide and .75 miles deep. "It's considered to have produced more copper than any other mine in history – more than 19 million tons.</p> <p>The mine has been in production since 1906 but it was two brothers, Sanford and Thomas Bingham, who first discovered copper ore there in 1848. The mine was designated a National Historic Landmark in 1966 under the name Bingham Canyon Open Pit Copper Mine. It was added to the National Register of Historic Places in 1984.</p> <p>It is not surprising that Bingham Canyon has a long history of negative environmental impacts. Notice the absence of trees on the east-facing slope of the Oquirrh Mountains. They were killed by the early pollution of the smoke stacks from the smelting of copper in the late 1800's and early 1900's. The site was proposed to be added to the National Priorities List (Superfund) in 1994, but the owners avoided the formal listing by pursuing a voluntary cleanup of contaminated lands, removing 25 million tons of mining waste and consolidating sludge with elevated sulfate concentrations and capping it on-site. Asbestos, air emissions containing arsenic and mercury, and releases of selenium, copper, arsenic, zinc, lead and cadmium as well as chemical spills and groundwater contamination have plagued the mine into the 21st century. These have impacted local fish, migrant bird populations and wildlife habitat.</p>
Why We Have "The Greatest Snow on Earth"	<p>Rapid elevation change, canyons running east to west, and the West Desert, all have a tremendous effect of our weather and the moisture content of our snow. The canyon acts as a flue, directing moisture-saturated air up the canyon, where air is cooled and slowed by the steep ridges, resulting in heaving precipitation. A counterclockwise wind motion in the Salt Lake valley picks up water from the Great Salt Lake and the canyon flue captures portions of this weather pattern, resulting in enhanced quantities snow from this "lake effect."</p> <p>The annual precipitation at the Snowbird Center is about 54 inches of water per year. An average year of snowfall is over 500 inches of snow. That means Snowbird receives approximately 8 inches of dry snow for every inch of water. The average ski resort in California receives about 4 inches of snow per inch of water; we receive twice as much snow with the same amount of water. During the 2010-2011 Winter Season, Snowbird received 690 inches<sup>5</sup> – surpassing the 688 inches record from 1983-84. Snowbird received over 700 inches during the 2018-19 season<sup>6</sup>.</p>
Little Cottonwood Creek	Little Cottonwood Creek flows down canyon from the headwaters at Cecret Lake in Alta. The Utah Division of Wildlife Resources stocks LCC with trout, mainly Rainbow and Bonneville Cutthroat varieties.
A Little Schnapps	Preparatory construction associated with the tram began in 1969 but it wasn't until May 1971, that the crew responsible for building the actual tram works, towers and cars arrived from the

<sup>5</sup> Snowbird does not publish its annual snowfall history and snowfall totals can vary depending on the source. Previous versions of this document had a much higher number. The 690" value comes from the Apr. 27, 2011 issue of Powder Magazine. The same number appears on onthesnow.com, snowpack.com and snowbrains.com.

<sup>6</sup> Source: snowbrains.com

	Garaventa company in Switzerland. According to McConnell in <i>The Snowbird Tram</i> , these workers soon gave Snowbird the nickname of ‘Snow Hell’ as heavy snows fell all spring and again the next fall. The Swiss crew persevered under harsh conditions while working at extreme heights. But the effort wasn’t without serious support from their home base. As McConnell notes, it was estimated that “200 gallons of schnapps were shipped from Switzerland hidden within crates containing tram parts in barrels labelled ‘cable grease’....”
Twin Peaks Star as Mount Everest	During the IMAX filming of Everest, the crew realized they were short on film. They saved the film for the summit. To replace the needed footage of the last ascent, the ridgeline leading to the east Twin, directly south of the Tram, was used. Dressed in heavy winter gear, the team simulated the trek on a nice warm day in May. Snowbird has been the site of many TV commercials, and professional photography shoots over the years.
What's a Gad?	 An early mining tool that is still used by modern day rock hounds. It consists of a metal rod with a chiseled end and a pointed tip on the other end. They are sold on Amazon! One listing explains how it's used: “use angled chisel end for prying and lifting. Use pointed tip to break, chip away at, and crack open rocks and hard materials. This is the ultimate tool for heavy duty rock work.”
Stu O'Brien Memorial	O'Brien was the Director of Snowbird's Freestyle Ski Team. He appeared in Warren Miller's “Steep and Deep” movie, where he jumped from a helicopter at Cedar Breaks, Utah. He and Rick Shannon jumped from the Tram with skis on “on one beautiful April day.” A small shrine dedicated to Stu is tucked in the trees in Peruvian Gulch. A plaque there lists his five rules of skiing.
Warren Miller and Ted Johnson	Ted Johnson had Warren Miller put together a ski film to promote the idea of creating the Snowbird ski resort.
Film & TV Productions	Snowbird has appeared in: <ul style="list-style-type: none"> <li>• Real Housewives of Salt Lake City (upcoming season)</li> <li>• Superheros of Stoke</li> <li>• Hot Dog ...The Movie</li> <li>• Backstreet Boys Music Video: I'll Never Break Your Heart (snow version)</li> </ul>
Hellgate	The narrow part of the canyon between Snowbird and Alta, with blue and white limestone cliffs towering above, takes its name from Fritz Rettich's early-twentieth-century Hellgate group of mining claims. He and his son Hugo worked the property until the latter's death.  The tale of Brigham Young naming the cliffs the “gates of hell” and forbidding his followers to cross beyond because of the debauchery of the canyon miners living in Alta makes a good story, but no documentation of the story can be found.
“Ski with a Ranger” Notes	Host Mary Murphy shared this after her tour:  “Two things the ranger volunteer said that I found super cool was that the snow cat drivers regularly have coyotes following them in the evening hours. The snow cat vibrations scare the voles, moles and mice out of their burrows and the coyotes get a free dinner. The coyotes have also learned to stay out of the way of the snow cat. ... Deer migrate out of the canyon in the winter time as the snow pack typically is too deep for them. Cougars follow the deer down. Deer legs are jointed so they have to pick up each leg and step or bound, very difficult in deep snow and lots of energy for them to do. Moose on the other hand are jointed differently, almost sounded like double jointed, which makes it easier for them to move in the snow pack. Animals typically in the canyons are moose, snowshoe hare, ermine, black bears, porcupines, and various smaller voles, moles, mice, etc.”

## Additional Background

This section includes additional information from previous tour manuals as well as new material that may be of interest to Hosts.

### The Stories Behind Snowbird Trail Names

([www.snowbird.com/blog/snowbird-trail-names/](http://www.snowbird.com/blog/snowbird-trail-names/))

Imagine naming nearly 100 children! This was a formidable task that Snowbird encountered in trying to choose names for all of its trails and lifts when the resort opened in 1971. And with more runs and lifts added in the 49 years since, it's an on-going process. So how do they get their names?

Some trails are labeled after the obvious flora or fauna found on the mountain; some take on the namesake of local legends; others go to the highest bidder. Other names come from the canyon's bawdy mining history and a handful resulted from the Naming Party, a social event Hosted by Dick Bass.

Hearing these tales of how names were chosen is like listening to folk legends and Dusty Sackett a former Snowbird Ski Patroller and local historian, tells the stories well.

"Chip's Run was named for the son of a Bass friend who died in the Vietnam War," says Sackett.

"Silver Fox took its tag from Ted Johnson, who bought up the old mining claims and was Bass' Snowbird partner during the resort's inaugural years. His hair was prematurely gray, so he was nicknamed the Silver Fox."

Several runs and a lift are named Wilbere, but who was that? "Johnson's former wife, Wilma, cooked in the kitchen of Alta Loge under the tutelage of a European chef who had a little trouble pronouncing her name," states Sackett. "He called her 'Wilber,' and the name stuck. An E was added at the end to feminize it. When Snowbird opened, she climbed Tram tower 4 and christened it with a bottle of champagne." Look for a plaque on the tower that commemorates the event!

Bananas, Tiger Tale and Harper's Ferry came from the Naming Party.

Then there are mining names and a few have double meanings. West Second South refers to the red light district where women were easy, so as a trail it's an easy run. Big Emma was either a madam at Alta or a mine at Alta. Whoever she was, Big Emma is also an easy run.

Sackett mentions that, "Regulator Johnson and Black Jack were both mines. Gad Valley, Gadzoom and all the other gads refer to a pointed mining tool. A gad was used to break ore."

Dalton's Draw took its' name from Charlie Dalton, an Alta patroller who regularly skied from Alta to Snowbird. Alice Avenue is named for Dick Bass' wife, who he called "Sweet Alice from Dallas." Bassackwards is named for Bass himself.

Geographic features are also namesakes. The Road to Provo heads south, the same direction you would drive to get to Provo. Phone Shot 3 is a bit more complex. Before the days of cell phones, there was a post with an emergency phone on it at the top of the run. The word shot is from the slang usage: "I'm going to take a shot down that run."

Junior's Powder Paradise gives homage to Junior Bounous, the resort's first ski school director and pioneer in the ski industry.

## Transitions (2015-2018)

Dick Bass, original funder and co-founder of Snowbird, died in 2015 at age 85. Ted, 'Silver Fox', his co-founder passed away in January 2018 at age 91. Just a week later, Ian M. Cumming also passed away. Ian owned the majority share of Snowbird (see Cumming and Bass family partnership above).

### Dick Bass dies at 85

Texas oilman was first to scale 'seven summits'

By Steve Chawkins

Dick Bass, a poetry-spouting Texas oilman who was the first climber to scale the highest peak on each of the seven continents and for a time was the oldest to top Mt. Everest, has died. He was 85.

Bass died Sunday, July 26, 2015, at his home in Dallas. He had pulmonary fibrosis, according to a statement from Snowbird, the Utah ski resort he started in 1971 and owned until 2014.

At various times in his career, he also was a part-owner of ski areas in Vail and Aspen. He owned ranches in Texas and coal mines in Alaska. He grew up around the oil fields of Oklahoma, where his father, Harry W. Bass, developed portable drilling rigs and became one of the largest natural-gas processors in the U.S.

"I chose my father very carefully," Bass later said. "He gave me the perfect launching pad."

Often described as a larger-than-life character, Bass blended relentless enthusiasm and profound optimism with operatic intentions and raw guts.

"He is an honest, likable man haunted by a need to keep proving himself," the Boston Globe said in 2000. "He will bring himself to tears talking about the value of integrity and the gift of life."

In an interview with The Times, David Breashears, one of the world's top climbers and the first American to ascend Everest twice, described Bass as "a poet, a visionary and a mountaineer with the heart of a lion."



An active skier and tennis player, Bass never trained for his grueling climbs. "I was befuddled by his astonishing ability to perform at high altitude," said Breashears, who accompanied Bass at Everest. "I had to tell myself I wasn't imagining it. It made no sense to me."

Bass, who said he "never planned to climb anything, except out of bed in the morning," was 51 when he started his record-setting expeditions. He was 55 when he bagged Everest on April 30, 1985, having already climbed Aconcagua, in South America; Denali, in Alaska; Elbrus, in Russia; Kilimanjaro, in Africa; Kosciuszko, in Australia; and Vinson Massif, in Antarctica.

Frank Wells, his main climbing partner, succeeded on all of the peaks but Everest. Wells, who quit his job as president of Warner Bros. Studio for the grand effort, also was a novice.

"At first glance, I just thought they were a couple of dilettantes having a midlife crisis," said Rick Ridgeway, a renowned climber who was hired by the pair to organize and Guide several of the treks.

After a little time with them, Ridgeway said, he changed his mind.

"They had hardly any chance of pulling it off, but they were going to do it with verve, vigor and no looking back. They became mentors to me; their example was a Guide to what passion, commitment and tenacity can get you."

On Aconcagua, Bass stumbled in a hole, painfully shredded a leg muscle, and hobbled down 10,000 feet before Argentine soldiers on maneuvers loaded him onto a mule and led him 20 miles to a road. In one of Bass' three attempts on Everest, Marty Hoey, a tough female Guide who had taught Bass some hard lessons on Denali, plunged 6,000 feet to her death. Her body was never found.

"That will be with me till the day I die," said Bass, who recruited her for his climbs when she was on the ski patrol at Snowbird. "I just admired her so much. I respected her so much."

At exhausting times, Bass would lift his party's spirit by breaking into verse. On Vinson Massif in Antarctica, the temperature was at least 40 degrees below zero, water in the canteens was frozen solid, and biting on a candy bar "was like chomping down on a bar of steel," Ridgeway wrote in "Seven Summits," a 1986 book he wrote with Bass and Wells.

"We were doing a little war dance, stomping our feet and swinging our arms. Then Bass got poetic: *Talk of your cold, through the parka's fold, it stabbed like a driven nail...*

It was a line from Robert W Service's "The Cremation of Sam McGee," one of the Yukon bard's many sagas that Bass had memorized and would recite, unbidden, on the trail and in the tent.

When Bass and Ridgeway reached the top and wrapped each other in a bear-hug, Bass dipped into "Sam McGee" again: *When our eyes we'd close, then the lashes froze, 'til sometimes we couldn't see....*

Richard Bass was born in Tulsa, Okla., on Dec. 21, 1929, and wanted to be a boy's prep school teacher.

"I was going to be a Chips reincarnate," he told the publication Utah Business in 1991. "Did you ever see 'Dead Poets Society?' That was me. I was going to be that very thing."

Instead, he studied geology at Yale and did graduate work in petroleum engineering at the University of Texas. He served on a Navy aircraft carrier during the Korean War and had his first taste of climbing — though he always called himself "a high-altitude trekker" rather than a climber — at Mt. Fuji in Japan.

In 1962, Bass was among the original investors in Vail. He and his brother Harry Jr. later developed the nearby Beaver Creek resort.

Developing Snowbird, he came close to bankruptcy a number of times. After an around-the-world trip with his adult children, he realized that "I had really been hammered down — by bankers, by competitors, by environmental groups, by people with their hands in the cookie jar. Plus, I had a divorce thrown in there too."

Physical achievement — whether on mountains, or running the original marathon route laid out by the ancient courier Phidippides, or swimming the Hellespont a la Lord Byron — was an antidote.

"Nobody thwarted me as I struggled up the mountainside," he wrote. "I had definite goals and I realized a tangible sense of accomplishment."

Over the years, Bass encountered his share of critics. In his popular book "Into Thin Air," author Jon Krakauer dismissively described Bass as a wealthy Texan who was "ushered to the top of Everest."

"Previously, Everest had by and large been the province of elite mountaineers," Krakauer wrote. "Bass' ascent changed all that."

Phil Powers, a mountaineer who is chief executive of the American Alpine Club, said Bass's well-publicized pursuit of the seven summits "launched a whole new world of adventure travel and a whole new business channel for Guides." He said the quest had a healthy ripple effect on people who weren't about to brave Antarctica but might be inspired to take a weekend hike.

Bass was blunter about his critics. "They resent some 55-year-old yahoo from Texas climbing these mountains they'd dreamed about. When I see Guides now, they hug me because the seven summits made the mountain-guiding profession. It made them!"

Bass' first two marriages ended in divorce. He is survived by his wife, Alice, four children, and 13 grandchildren as well as five stepchildren and 11 step-grandchildren.

Bass' climbing partner Frank Wells became president of the Walt Disney Co. in 1984. He died in a helicopter crash 10 years later.

In his later years, Bass planned to return to Everest and reclaim his title as its oldest climber, which had since been surpassed. He never did, but he was active until his illness forced him into a wheelchair.

According to one widely circulated story, he was on a cross-country flight when, in his loquacious way, he deluged his seatmate for hours with details of his treks on all seven continents. As they were about to land, he realized he hadn't paused to ask his new friend anything about himself, his job, or even his name.

"That's OK," the man responded, extending his hand. "I'm Neil Armstrong."

#### **Ted Johnson, the visionary behind Snowbird, dies of his injuries after being struck in a crosswalk**

By Mike Gorrell

Published: January 30, 2018

There's a run at Snowbird Ski & Summer Resort that pitches 2,500 feet from the top of Hidden Peak to the resort base. It's called Silver Fox — and it's named in honor of stylishly coiffed Ted Johnson, who teamed up with Texas oilman Dick Bass to establish Snowbird Ski & Summer Resort in 1971.

Johnson died late Monday in Santa Barbara, Calif., of injuries suffered when he was hit in a crosswalk by an alleged drunk driver. He was 91.

Johnson's son, Peter, sent a message to family friends saying his father succumbed to extensive injuries he suffered on Jan. 23. He was heading from a hotel to a hospital, where his wife was receiving treatment after being evacuated from a northern California community damaged by recent mudslides. California media reported that the driver, arrested on suspicion of driving under the influence, had two previous DUI convictions.

"While the details of this event are unimaginable and inexcusable, we take solace in the knowledge Ted lived his final days with vigor, helping friends and family uprooted by the Montecito floods," his son said.

He posted a picture of his father smiling as he weaved through powder at Snowbird, recognizable by the granite outcroppings in the background.

"Almost everything at Snowbird — from the Tram to the village to the spirit of Snowbird's first employees — started with Ted," said Bob Bonar, who worked for Johnson before the resort opened and now is its longtime president and CEO. "It was Ted's vision, intellect, endearing personality and persistence that brought Snowbird to life."

While serving for a decade as manager of Alta Lodge, Johnson recognized the potential for a ski resort just down the way in Little Cottonwood Canyon, according to his Intermountain Ski Hall of Fame biography. He was inducted in 2007.

Starting in 1965, "the wily 'Silver Fox,' an entrepreneur whose quest was not to be denied, put his foresight and fortitude into a dream of establishing a resort," the Hall of Fame summary said, adding that he bought the Blackjack and other mining claims adjacent to lands administered by the National Forest Service, which already supported Alta Ski Area's use of public lands for skiing.

Johnson pursued his development plan for several years before attending a party in Colorado where he met Bass, who sat on the boards of both Vail and Aspen ski resorts. Johnson regaled the adventurous oilman with his vision, winning him over enough that Bass came to Utah the following week for a firsthand look.

Bass liked what he saw in Little Cottonwood, providing the financial wherewithal to get Snowbird off the ground on Dec. 23, 1971. Johnson remained a partner in Snowbird for three years before selling his interests to Bass.

"The passing of Ted Johnson is so sad," said Mike Korologos, a ski historian and The Salt Lake Tribune's ski writer when Snowbird opened. "He was equal portions of guts, a dream, determination, a sense of humor and a gentleman's style."

"I got to know him very well when he was grooming the top of Hidden Peak for the upper terminal for the Tram," Korologos added. "He told me [later], at one of our early-days-of-Snowbird storyfests, that I was at Snowbird so often he thought I was a spy for Alta."

Snowbird co-founder Ted Johnson spent the last years of his life in California. He died late Monday of injuries from an auto-pedestrian accident in Santa Barbara.

Johnson is survived by his wife, Shirley; children, Peter and Kylie; three grandchildren; and ex-wife, Wilma.

#### **Ian Cumming Passes**

From: [www.skiinghistory.org/lives/ian-cumming](http://www.skiinghistory.org/lives/ian-cumming)

#### **POWDR Corp. and Snowbird Owner**

Passing Date: Friday, February 2, 2018

*By Mike Korologos*

Ian Cumming, a one-time Wall Street financier and more recently an influential figure in the ski resort industry, died February 2, 2018 at his home in Jackson Hole, Wyoming. He was 77.

As much behind the public scene as his enterprises are in front of it, Cumming was affiliated with POWDR Corp., headquartered in Park City and founded in 1994 primarily by his son, John, with other members of the Cumming family and Park City business associate Nick Badami.

The portfolio of privately-held POWDR Corp. includes 10 mountain resorts: Copper Mountain and Eldora Mountain Resort in Colorado; Killington and Pico Mountain in Vermont; Boreal Mountain Resort and Soda Springs in the Lake Tahoe region of California; Mt. Bachelor in Oregon; Lee Canyon in Nevada; Gorgoza Park in Park City (snowtubing) and majority ownership in Utah's Snowbird Ski and Summer Resort.

A rare breach POWDR Corp.'s penchant for privacy occurred in 2013 when it reluctantly sold Park City Mountain Resort to Vail Resorts after a contentious legal battle over a lease.

With a low-key persona, Cumming was reluctant to speak to the news media. He was a native of Salt Lake City and was graduated from the Harvard Business School in 1970.

In the run-up to the Olympic Winter Games of 2002 in Salt Lake City, Cumming served on a committee that helped develop venues for Games. In addition, he and his wife, Annette, were longtime supporters of the U.S. Ski and Snowboard Team Foundation.

In 1978 Cumming co-founded an investment firm called Leucadia and built it into a multi-billion dollar Wall Street conglomerate that held interests in mining, manufacturing, vineyards, real estate, casinos, hotels and resorts. He retired from that firm in 2013.

## The Luck of the Draw

By Cate Love

*Note: This article is a beautifully written, broad-ranging summary of Snowbird's history. It is slightly out of date but worth a read.*

You could say the history of Snowbird starts and ends with a dream shared by two men, Ted Johnson, an athlete and adventurer with an idea for the future of skiing; and Dick Bass, an entrepreneur with a passion for poetry and high places. Thirty years later, this world-class, year round resort owes its birth to the vision and tenacity of these two men. But, as in the game of chess, every move is the result of all previous moves. So Snowbird is the result of a series of events' some pure luck, others pure genius.

It all started tens of millions of years ago (fairly recently in geologic terms) as the earth began shifting and heaving and raising the Wasatch Mountain Range out of a basin of volcanic ash. Then it got colder, wetter and glaciers formed on the young mountains as the basin below filled with water. The glaciers moved, the rivers flowed, volcanic activity and faulting continued and the canyons of the Wasatch front began to take shape. "U" s for the glacier's gravitational flow, "V"s for the river's erosive carving. Little Cottonwood Canyon, yet nameless, incubated.

Fast-forward a few million years. Nomadic Native American tribes found an abundance of wildlife and water in canyons of the Wasatch. For hundreds of years they fished in Little Cottonwood Creek and hunted small and big game in the basins of the canyon.

Mormon settlers brought structure, industry and historical dates when they made their way off the range in 1847, settled into Salt Lake Valley and began exploring nearby canyons. The next year, the United States government signed the treaty of Guadalupe Hidalgo, acquiring present day Utah, California, New Mexico, Arizona and Nevada for \$15 million and other considerations.

Little Cottonwood Canyon offered a seemingly endless wealth of timber, stone, water and wild game and it didn't take the settlers long to exploit these natural resources. The first sawmill was erected at Tanners Flat in 1851. Tannersville was the first settlement, complete with sawmill and boardinghouse. Construction of the Church of Jesus Christ of Latter Day Saints (LDS) Temple began in 1855, using granite from a quarry near the mouth of Little Cottonwood Canyon.

The quarry work supported a nearby town called Wasatch, 1.5 miles up the canyon road. The temple was completed 38 years later and the town became Wasatch Resort, an idyllic mountain getaway then. Wasatch Resort exists today as a small residential community. The church's new Conference Center, north of Temple Square, was constructed using granite for the same quarry.

In 1863, the discovery of silver ore deposits would change this corner of the Wasatch forever. One hundred years after Spanish conquistadors used Indian slave labor to extract "money rock" to decorate their castles, new settlers would create a whole new life from the shimmering treasure of the Wasatch.

Hoping to strike it rich, people flocked to Little cottonwood and by 1870, several small settlements dotted the canyon with names such as Cheatum, Hogum, Galena City, Union City, Emmaville, and Gold City. The Davenport and Flagstaff smelters were constructed at the canyon's mouth, along with a larger settlement called Granite City. Central City was built nine miles up the canyon and was named both for its central location to the mines and its position as a center for the mining and lumber industry. Later, the entire town moved farther east and was renamed Alta City, presumably after Alta Hotel, its first establishment.

The Civil War had ended and rail stretched across the country. Many sought their fortunes in the West. Soldiers, prospectors, foreigners and fugitives poured in to the work the mines and by 1873 more than 8,000 people lived in the canyon. The Emma Mine (the namesake of Snowbirds' Big Emma ski run) was one of the most lucrative silver mines in Little Cottonwood producing approximately \$3.8 million in precious silver.

People, many whom had little or no formal education, named mining claims and locations phonetically.

Cecret Lake at Alta and Snowbird's Iron Blosam Lodge are examples of their legacy. If their spelling was unrefined, the life was even more so. Alta was a rough boomtown. At its peak, the town was reputed to have had a killing a day. Saloons made a killing as well, with miners consuming as much as a quart of alcohol per day each. You can bet the town attracted its share of gamblers, gunslingers and ladies of ill repute.

In 1875, a narrow-gauge railroad was built from Wasatch to Alta up the north side of the canyon. Mules were used to pull the cars uphill, since the grade was too steep for state-of-the-art steam engines. Cars loaded with ore coasted back downhill, the brakeman struggling to control hazardous speeds. The foundation of a snowshed, built to protect the lines from heavy snowfall and avalanches, can still be seen in the upper canyon. It's called the Chinese wall, names for the immigrant laborers who constructed it.

The general economic crisis at the end of the 19<sup>th</sup> Century, the exhaustion of most of the mines and the disappearance of much working capital brought the bustling town of Alta down in the 1890s. And even though another boom was on the way, it would never again reach the size it had in the previous three decades.

Alta's second boom began in 1904 with a new rich strike. Population grew to nearly 1,000. Over the next 10 years, more new veins of ore were uncovered. The resurgence brought a Michigander named George Watson to Little Cottonwood Canyon. A colorful character and arguably Alta's most famous inhabitant, Watson played a key role in the development of skiing here...but that was yet to occur.

New technology accompanied the new boom and in 1916, the Michigan-Utah Mining Company resurrected the old narrow-gauge to Tanner's Flat and joined it with an aerial tram to the mine. Eventually, that ore tram was converted into Alta's first chairlift, the second in the world (the first was in Sun Valley in 1936)

The production of silver ore peaked in 1912, and declined steadily after that. The great crash of Wall Street in 1929 finished it off.

During those years of decline, the enterprising Watson had a stroke of questionable genius, which proved lucky for the modern ski industry. As mining slowed and town's population dwindled, he bought up all the old mining claims he could get, convinced that there would be another silver boom. By the mid-30's, he was alone in Alta, so he voted himself mayor. He figured he'd be in a commanding position when the mining companies rolled back in.

To date, they haven't. By 1938, heavily mortgaged and owing property taxes he couldn't pay, Watson turned over the surface rights of his land to the U.S. Forest Service. In exchange, the U.S. government forgave his debt and allowed him to remain in his little cabin at Alta, not far from the base of present-day Wildcat life. It was a scenario he'd discussed as early as 1933 and it suited him just fine. Watson lived on in his little cabin, entertaining skiers with wild drinks and even wilder tales until his death in 1952.

The late 1920's and early 30's brought ski tourism and instruction to the American public, who loved watching skiers soar like giant birds off crudely built jumps. The late 30's brought Alta Ski Lifts. You could buy a day lift ticket for \$1.50.

Fast-forwarding through the planning, negotiating and dreaming that brought Alta to life. World War II and the 10<sup>th</sup> Mountain Division training at Alta, the pioneering of snow avalanche study, and the first three decades of skiing in America to 1964.

Ted Johnson, a California native who left Bakersfield to travel the world years before, was managing Watson's Shelter, Alta's mid-mountain restaurant. Ted was an adventurer who established himself as a competitive bicyclist in 1943, prior to joining the Air Force and serving in World War II. After the war, he became an avid surfer and skier, spending his time in Hawaii and Sun Valley, Idaho. He discovered Alta in 1954, managed the Rustler Lodge and taught skiing for the legendary Alf Engen and Junior Bounous, who still teaches skiing today at Snowbird. He skied so smoothly they called him the Silver Fox, and he frequently appeared in Dick Barrymore ski films of the early 60's.

In 1964 Johnson, having often skied beyond Alta into Peruvian Gulch, began to nurture a kernel of an idea. Originally, he wanted to build a lodge to serve Alta. But, it grew into a dream of building an entire ski resort. He started buying old mining claims in the area. The first of these was Black Jack, just above today's Cliff Lodge. Eventually, he bought the Snowbird claim, upon which today's Snowbird village stands. Johnson spent years tracking down the owners and purchasing the rights to land around Snowbird. He borrowed money from anyone who would lend it.

Another Alta local introduced Johnson to ski film mogul Warren Miller. The two formed a limited partnership and produced a clip showing the potential of Snowbird. The idea was to raise funds for the new area. They raised \$40,000

and constructed models of Snowbird village. They tried for years to find an investor with the funding and the foresight to help him develop Snowbird, which he figured would cost about \$3.5 million.

Johnson had it all figured out: An aerial tramway would take skiers to the high point between Peruvian Gulch and Gad Valley.

As luck would have it, Johnson was traveling through Vail in September 1969, along about the time Vail's board of directors was dining at the Gasthof Gramshammer. Having friends on the board, he was invited to dinner and just happened to sit down across the table from an outspoken Texas businessman named Dick Bass.

When Bass sat down to dinner, he tried to engage this reclusive, unfamiliar man in conversation. He asked Johnson about himself and his life. The powder skier seemed reluctant to reveal anything and Bass took it as a sort of challenge. Eventually, charmed no doubt by the tenacity of Bass' conversational skills, Johnson began to share his dream.

The next morning, Bass watched the 13-minute film, narrated by Warren Miller. Johnson explained the advantages of the area; moderate winter temperatures, accessibility of the resort to a major international airport, the average snowfall being twice that of Vail, with more vertical and greater scale and variety of terrain. No other ski area in America had all those salient factors going for it at once. Not long after their chance meeting, Bass met Johnson in Utah to tour the area.

Johnson's enthusiasm was so infectious and his plan was so inspiring, according to Bass, "this 160 pound, large-mouthed Bass was hooked." But, being a successful businessman, Bass had to look at all the angles. In early December, the two toured a handful of ski areas in the eastern U.S. The first part of the next year, they went to Jackson Hole, Sun Valley, Mammoth and other western ski area. The next stop was Snowbird.

Dick Bass was born in 1928 in Tulsa, Oklahoma, the son of an independent oilman. In 1932 the family moved to Dallas, Texas. Highly driven, blanketed curious, and somewhat hyper enthusiastic, he entered Yale University at the age of 16. His main focus of study began as humanities – literature and poetry – but "pragmatism overcame (his) idealism" and he graduated with a Bachelor of Science degree in geology. After serving on an aircraft carrier during the Korean War, Bass joined the family oil and gas business and ranching operations back in Texas.

A hugely energetic and well-read personality, Bass' lust for life led him to Aspen in the 50s, where he learned to ski, then to Vail, where he became an investor and regular skier. He was invested in Aspen and Vail in 1969. They last thing the 39 year old needed was to put money into another ski area (so he thought). But, as he looked across the canyon from a perch on Hellgate, Johnson's dream became a part of him, and so Dick Bass made the necessary financial commitment.

The next several months took the new partners to ski areas around the world, researching tram technology and resort layout. They overcame many obstacles in constructing the centerpiece of Snowbird: the Tram. They drafted and defended environmental impact studies, met local, state and federal regulations. They upheld their dream against public skepticism, environmental attack and governmental red tape. The cost of opening, which actually occurred in December 1971, was \$13.4 million, a bit more than Johnson had planned on in the beginning. Your lift ticket would have cost \$7.

A team of architects, landscape architects and planners developed Snowbird's master plan. Bass and Johnson wanted the resort to pay respect to the environment, fit into the natural setting and maintain an open appreciation for the surroundings: pine covered slopes, wildflower meadows, peaks of quartzite, dolomite and granite. Environmental concerns played a major role in the construction of Snowbird's buildings. Enormous snow load prompted the sturdy concrete and steel structure of all of the buildings. Abandoned silver mines on either side of Little Cottonwood Creek were incorporated into the overall resort design and became a vast underground water reservoir, providing culinary water for the resorts of the canyon to this day.

Snowbird opened with its signature Aerial Tram, a beginner rope tow, and three double chairlifts, Wilbere, Gad Valley and Upper Gad Valley chairs. Village amenities included the Lodge at Snowbird and Snowbird Center with restaurants, shops and lounges.

It cost more financially, spiritually and emotionally to build Snowbird to the standards set by Johnson and Bass than either of them originally planned. In 1974, Johnson sold his share in the resort in order to spend more time with his family. Bass carried on, incurring more and more debt in his quest to build the resort as a renaissance center for the enhancement of body, mind and spirit.

The Turramurra Lodge was built (now the Inn at Snowbird) – along with the country's first major timeshare development, the Iron Blosam Lodge. Snowbird acquired The Cliff Lodge in the 70's and added another wing in the mid-80s, effectively doubling its size and incorporating a first-class resort spa facility.

Meanwhile, on-mountain improvements included the Peruvian, Chickadee and Little Cloud chairlifts. In the mid-90's Baby Thunder was constructed to access more beginner and intermediate terrain just west of the original ski area boundary. Then the canyon's first high-speed quad Gadzoom, was built in 1997.

In the mid-90s, Snowbird renovated the west wing of the Cliff and created a premier vacation ownership property, the Cliff Club.

Two years ago, Snowbird's ski area boundary extended into Mineral Basin, adding 500 acres to its already impressive size and another high-speed quad, Mineral Basin Express (MBX). And this year, another dream came true with the construction of Baldy Express, a new high-speed quad from the base of MBX to the saddle between Bald and Sugarloaf peaks at Alta. With this new development, Snowbird goes back to the future so to speak. Now Snowbird's skiing public will be able to turn in the tracks of its history, without having to climb uphill as their predecessors did.

In the next few years, Snowbird expects to build a new facility on Hidden Peak, providing food service, skier services and an environmental interpretative center, plus hill maintenance and ski patrol facilities. The resort also anticipated upgrading the Little Cloud chairlift to a high-speed detachable quad and constructing a day lodge at the base of Gad Valley.

## The Continual Quest to Improve

Snowbird made a conscious effort to expand its beginner and intermediate terrain with the installation of the Baby Thunder Chairlift in 1995. Two years later, the Gad I chairlift was improved to a high-speed quad and appropriately named Gadzoom.

The ongoing quest to improve received a major boost in April of 1999 when a crew of 9 people composed of Garaventa/CTEC and Snowbird employees began the task of hauling the lower terminal of the high-speed Mineral Basin Express chairlift to the base of the coveted powder bowl. The parts were actually delivered to the Alta Ski Area parking lot where they were loaded onto a trailer and hauled, via snowcat, through Alta and over Sugarloaf Pass to Mineral Basin. Some of the pieces weighed as much as 16,000 pounds and took 4 snowcats to move into place.

Since there was no crane available to unload parts, the crew played a game of industrial "Jenga", stacking cribbing under each piece and then jacking them up to be able to pull the trailer free. The process lasted until mid-May due to some of the heaviest snowfall of the winter.

In early June the top terminal pieces were delivered to Snowbird and then positioned in a staging area outside the Tram Club. In mid-June the task of hauling parts to Hidden Peak began. Garaventa/CTEC engineers designed a special lifting frame and system to utilize the Aerial Tram as a giant moving crane. Each morning, crews loaded up to 16,000 pounds of lift parts and other construction materials under the red tramcar and slowly hauled the load to Hidden Peak. In early July, concrete was taken up the mountain by truck and lift tower installation began.

Midway through the 1999/2000 season Mineral Basin and its 500 acres of additional intermediate and advanced terrain opened. Little Cloud and Gad II lifts were recently upgraded. Newer additions include The Summit restaurant atop Hidden Peak, bridges connecting Snowbird Center to The Cliff Lodge and Peruvian base, and SeventyOne, a new restaurant in The Cliff Lodge with a retro vibe.

## 52-Hour Interlodge

By Adam Fehr 02-12-2020

(This article appears at [www.alta.com/stories/52-hour-interlodge](http://www.alta.com/stories/52-hour-interlodge))

*NOTE: While this article is about the experiences at Alta during a very unusual storm cycle in the 2019-20 season, the same cycle affected Snowbird in much the same ways. It speaks to the power and importance of avalanches in Little Cottonwood Canyon.*



Alta, UT was just interlodged for the longest time in town history. Photo: Rocko Menzyk

### **Stellar Dendrite—The Double-edged Snowflake**

The Alta snowflake logo, known worldwide in the ski community, did not come about by happenstance. The Alta Flake is based on the stellar dendrite, a snow crystal with hexagonal tree-like structure and branches. They are razor-thin, symmetrical in shape and create the fluffy snow that made Alta the birthplace of powder skiing.

### **The Alta Flake can also be a double-edged sword**

Throughout Alta's storied, snowy history, there has been a litany of snow-related events that remind us that the mountains are in charge. And while our ski patrol, mountain ops, and lift crews are the best in the business, sometimes Mother Nature gets the upper hand on all of us.

**This past storm adds another chapter to Alta's extensive history of weather and snowfall-related events.**

#### **NOTABLE LITTLE COTTONWOOD AVALANCHE EVENTS**

**January 12–17, 1881:** Avalanches during a period described by Alta resident Dr. E.J. Simmons as "one of the most eventful known in the history of Alta" leave an estimated fifteen people dead (Kalitowski 1988).

**March 7, 1884:** Avalanches pummel Alta, killing twelve.

**February 13, 1885:** Avalanches take another fifteen lives at Alta. Fifty feet of snow deposited on what was then Main Street.

**February 1939:** First use of explosives for avalanche control in Little Cottonwood canyon, with the resulting slide burying 2,000 feet of the highway under fourteen feet of snow.

**December 1972:** A huge avalanche fills the top floor of the Alta Lodge with snow and leaves a Volkswagen Beetle on the roof.

**December 29, 1973:** Avalanches cause \$250,000 in damage (1973 dollars) to vehicles and buildings at Alta and Snowbird.

**Spring 1983:** The original Our Lady of the Snows Chapel is damaged by a wet spring avalanche and torn down. The current, more heavily fortified chapel was built in 1993–1994.

**March 14, 2002:** Avalanche control work releases a slide that crashes into the Alta-Peruvian Lodge, knocking out windows in some rooms and burying several cars. Guests were safely lodged elsewhere at the time.

The week got off to an unusual start. Just as Super Bowl Sunday came to a close, a cold winter storm made its way into Utah as a mass of cold air blanketed the state. **Temperatures at Alta plummeted 47 degrees**—from 43F to -4F in just 24 hours.

Snow started to fall in the Salt Lake Valley and surrounding mountain benches but did not impact the upper elevations of the Wasatch Mountains. By Tuesday morning, locations in the valley reported 18 inches of snow, while **Alta recorded just 8.5 inches of 7% density stellar dendrites**.

Subzero temperatures started to warm as a stream of tropical moisture and westerly winds took aim at Little Cottonwood. From Wednesday afternoon into Thursday morning, **Alta received 9" of heavier, 10% density snow**. This wet, wind-loaded layer overwhelmed the fragile dendrites from earlier in the week, triggering overnight natural avalanches in Little Cottonwood Canyon.

**Thursday - February 6th, 2020**

Interlodge went into effect at 5:30am on Thursday morning, requiring all residents, visitors, and employees to stay inside until avalanche control had been completed. Avalanche mitigation by the Alta Ski Patrol and the Utah Department of Transportation (UDOT) produced results as the snow and winds kept coming. While a handful of Alta Ski Patrollers, employees and skiers were able to make it up the canyon in the morning, the decision was made at noon to keep Alta Ski Area and Snowbird closed for the day. That evening, a one-hour window allowed hotel guests and employees to leave the canyon, everyone else was still under interlodge protocol.

### Friday - February 7th, 2020

With the canyon on lockdown, the snow and wind kept coming. By Friday morning, an additional **19 inches of 19% density snow had fallen**. Additional natural avalanches occurred overnight, burying miles of Highway 210.

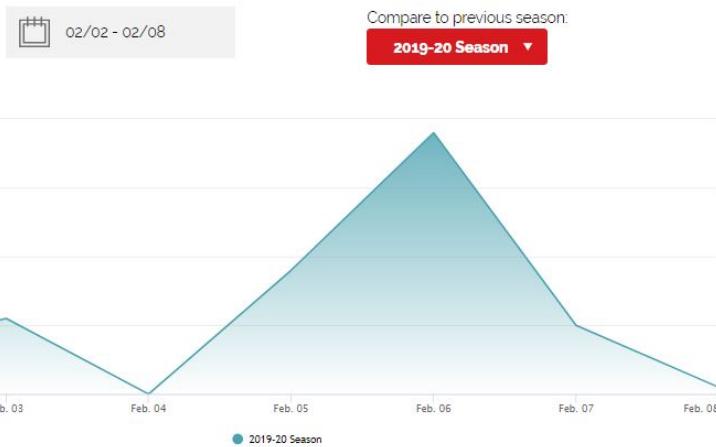
The Town of Alta remained interlodged as further mitigation work from Alta Ski Patrol and UDOT produced extensive avalanche activity. Control work on Toledo Bowl created a slide that crossed the highway crashing into the Alta Peruvian Lodge parking lot, burying rows of empty cars. Another avalanche from the Hellgate area crossed Highway 210 and struck a cabin, shattering the windows and filling the residence with debris.

With Little Cottonwood Canyon looking more like a ski run than a highway, and more snow and wind on the way, the decision was made to keep the ski areas closed for a second day. Interlodge remained in place for the rest of the day and another night that saw **5 inches of 22% density snow** and more wind.

### Saturday - February 8th, 2020

As the sun rose on Saturday morning, the winds died down, the skies started to clear and Alta Ski Patrol and UDOT finished a third morning of control work. As UDOT went to work removing extensive debris from Highway 210, Alta employees started digging out the ski area. Cat crews, who had been working throughout the storm, finished their snow removal and grooming.

## SEASON TOTALS



Around 9:30am on Saturday, the interlodge restriction was lifted, and hotel guests and Alta residents were allowed to step outside for the first time in 52 hours. many of them choosing to click into their skis and enjoy the 33" of new snow blanketing the slopes of Alta.

The now upside-down snowpack didn't ski like a typical Alta powder day, but after two-plus days of confinement, it didn't really matter.

**Highway 210 finally reopened at noon on Saturday**—walls of avalanche debris and uprooted trees lining the road.

Days after the storm, locals are still digging out and sharing their 52-hour Interlodge stories with friends and family around the globe. While these stories are shared for years to come, Alta and the ski community were reminded that the mountains are in charge—a not-so-subtle reminder of the power of Mother Nature and the frailty of the double-edged snowflake.

**The 52-Hour Interlodge Storm by the numbers:**

- All-time record consecutive interlodge: 52 hours
- Longest sustained 30+ mph westerly winds (since 1980) = 72 hours
- New Water: 5.52"
- New Snow: 33"
- Average Snow Density: 16.7%
- Typical February Snow Density: 7.55%

While 33" of snow is not an atypical storm for Little Cottonwood Canyon, the massive amount of water and sustained winds contributed to a unique avalanche problem. Thanks to all of the lodge guests and employees for patiently waiting out the storm. A huge shout out to all of the amazing Alta, Snowbird, and UDOT employees working around the clock to open the road and the mountains as soon as possible. And a final thank you to the 35-plus men and women of the Alta Ski Patrol that stand on the front lines and make the tough decisions.

## SEASON TOTALS



## The Uinta-Wasatch-Cache National Forest

Uinta-Wasatch-Cache National Forest lands are located in three major areas:

- Northern and western slopes of the Uinta Mountains
- Wasatch Front from Lone Peak north to the Idaho border including the Wasatch, Monte Cristo, and Bear River Ranges
- Stansbury Range, in the Great Basin.

The Forest boundary encompasses approximately 2 million acres. Of these, approximately 1.2 million acres are National Forest land. The remaining acres are owned by state and local governments, and private. Timber, water, forage, wildlife and recreational opportunities are all found on these mountainous lands and are managed by the Forest Service to ensure sustained ecosystem health, using the methods best suited to protect the natural beauty of the area.

The Forest name, Uinta-Wasatch-Cache, pays tribute to two important groups whose survival and livelihood depended on the resources of the forests. Wasatch is a Ute Indian word meaning "low place in high mountains." Cache is a French word meaning "to hide" and is a legacy of the early fur trappers who were the first Europeans to visit the region. Cache Valley was the site where the trappers dug caves to cache their furs so they would be hidden and safe from detection until they could be traded. The Forest holds important clues to the natural history of the area. The oldest exposed rocks in Utah are in the Farmington Canyon Complex, which can be seen in outcrops near the mouth of Farmington Canyon. The Jardine Juniper tree, on the Logan Ranger District, is 1500 years old and is reputed to be the oldest living tree in the Rocky Mountains. Evidence of ancient oceans, volcanoes and glaciers can be found throughout the Forest. The shoreline of ancient Lake Bonneville can be traced in the terraces along the foothills.

Long before Europeans arrived, prehistoric Fremont, Shoshoni and Ute Indians lived in the valleys following the fish in the lakes and streams and the big game of the surrounding mountains. Early mountain men, trappers and explorers began to arrive in the 1820's. The promise of abundant wildlife lured trappers such as Jim Bridger, Kit Carson and Jedediah Smith. Peter Skene Ogden and John Weber were two explorers whose names have remained. Their explorations were critical to providing information used by the pioneer settlers who followed.

The Wasatch and Uinta Mountains provide essential and precious water supplies to the communities and farmers in Utah. Extensive watershed restoration work has been completed to assure continuous, high quality water supplies and prevent disastrous floods. Forest Service work in restoring these lands has won international acclaim.

Cattle and sheep are grazed on the Forest during the summer, but the numbers are restricted to ensure that minimal damage is done to the soil and vegetation. Forage produced on these lands provides food for both domestic and wild animals. The range provides food, water, scenery and recreation for people and homes for wildlife. It is managed to assure adequate amounts of these resources.

## A Geologic Tour of Little Cottonwood Canyon

By Christine Wilkerson

(Source: [geology.utah.gov/popular/places-to-go/geologic-Guides/virtual-tour-central-wasatch-front-canyons/little-cottonwood-canyon/](http://geology.utah.gov/popular/places-to-go/geologic-Guides/virtual-tour-central-wasatch-front-canyons/little-cottonwood-canyon/))

This road tour begins at a Salt Lake County geologic view park, located just north of the intersection of Wasatch Boulevard and Little Cottonwood Road. From here you can view evidence of prospectors seeking riches, glaciers creeping down the canyon, and earthquakes rupturing the ground.

North of the canyon mouth are mine dumps located in the oldest rocks (greater or equal to 1.6 billion years) in the canyon: the schist and gneiss of the Little Willow Formation. Prospectors mined minor gold deposits within this formation.

A massive glacier carved the canyon into its classic U-shape over thousands of years beginning about 30,000 years ago. This 12-mile-long glacier, the longest and largest in the Wasatch Range, stretched from Albion Basin down to Lake Bonneville's shores.

The boulder-strewn ridge on the south of the canyon mouth is the left-lateral moraine; the right-lateral moraine is pushed up against the hillside on the north. As you drive up the canyon, additional glacial evidence can be seen: hanging valleys between miles 4.6 and 6.3 on the south side of the canyon, and moraine remnants.

Repeated large earthquakes in the past tens of thousands of years created the long, steep slope cutting across the canyon mouth. In this area, the Wasatch fault contains some of the largest geologically recent fault scarps in Utah. The darker rocks at the mouth of the canyon, together with the darker (shale) and lighter brown (quartzite) rock layers along most of the northern ridge line up to Snowbird, were deposited as clay and sand in a marine tidal environment 1 billion to 850 million years ago.

Unconformably abutting these oceanic deposits (near mile 8.6) is a dark-colored rock unit called glacial till that contains a hodgepodge of boulders, cobbles, and pebbles abandoned by continental glaciers around 850 million years ago.

The light-colored quartz monzonite (granite) that forms the majority of the canyon walls intruded as magma and hardened underground about 31 to 30 million years ago.

The buff-colored quartzite, brown shale, and black and white limestone seen in the upper third of the canyon record the advances and retreats of multiple, long-lasting oceans present between 540 and 330 million years ago. Originally layered horizontally from oldest to youngest, these rock layers have been disarrayed by folding, tilting, and faulting. Located at the head and along the eastern ridge line of the canyon is another intrusive igneous rock. This magma body intruded about 35 to 33 million years ago and hardened into a granite-like rock called granodiorite. Both intrusives in this canyon aided in creating the rich mineralization found in Little Cottonwood mines. Numerous mine dumps dot the mountainsides surrounding Alta, evoking images of the once-lively mining district.

## For Further Reading

- *A History of Avalanche Mitigation in the Cottonwood Canyons*, Central Wasatch Commission, [cwc.utah.gov/a-history-of-avalanche-mitigation-in-the-cottonwood-canyons](http://cwc.utah.gov/a-history-of-avalanche-mitigation-in-the-cottonwood-canyons)
- *Alta Historical Society website*: [www.altahistory.org](http://www.altahistory.org)
- *Avalanche Busters: A Historical Memoir of the Snowbird and Alta Ski Patrols*, by Linda L. Bonar
- *First Tracks – A Century of Skiing in Utah*, by Alan K Engen, Gregory C Thompson, Mike Korologos, Mitt Romney, Ted Wilson
- *Lady in the Ore Bucket: A History of Settlement and Industry in the Tri-Canyon Area of the Wasatch Mountains*, by Charles L Keller
- *Secrets of the Greatest Snow on Earth: Weather, Climate Change, and Finding Deep Powder in Utah's Wasatch Mountains and around the World*, by Jim Steenburgh
- *Snowbird Secrets*, by Jackson Hogen, Dave Powers
- *The Snowbird Tram*, by Walt McConnell, M.D.,
- *Unofficial Networks website*: [unofficialnetworks.com](http://unofficialnetworks.com)
- *Wasatch Backcountry Rescue website*: [www.wbreescue.org](http://www.wbreescue.org)