

STEP 1 OBTAIN A LOCAL AVALANCHE FORECAST

These are available for your region by clicking on this link: www.avalanche.org A map will display links to over 20 different avalanche forecast and weather centers throughout North America. Additionally, there are many good avalanche related links on this page.

Heed their advice or risk suffering the consequences. This may well be the single most important piece of information you can obtain. Many people might have saved their lives had they simply accessed this free public bulletin.

This information is compiled by local experts. Reports will give you one of the following ratings:

DANGER	DESCRIPTION	TRAVEL SUGGESTIONS
LOW	Natural avalanches very unlikely. Human triggered avalanches unlikely. Generally stable snow; isolated areas of instability.	Travel is generally safe. Normal caution advised.
MODERATE	Natural avalanches unlikely. Human triggered avalanches possible. Unstable slabs possible on steep terrain.	Use caution in steeper terrain on certain aspects.
CONSIDERABLE	Natural avalanches possible. Human triggered avalanches probable. Unstable slabs probable on steep terrain.	Be more cautious in steeper terrain. Be aware of potentially dangerous areas of unstable snow.
HIGH	Natural and human triggered avalanches likely. Unstable slabs likely on a variety of aspects and slope angles.	Travel in avalanche terrain not recommended. Safest travel on windward ridges or lower angle slopes without steeper terrain above.
EXTREME	Widespread natural or human triggered avalanches certain. Extremely unstable slabs on most aspects and slope angles. Large destructive avalanches possible.	Travel in avalanche terrain should be avoided and travel confined to low angle terrain well away from avalanche path runout zones.

If you are a newcomer to backcountry travel during the winter, the above information may save your life. A weather forecast will typically be included with the Danger Forecast. Make a note of this forecast as later we'll talk about how weather influences the avalanche danger. Keep in mind that this forecast is a planning tool and conditions can change in the field. This is why we create options, also discussed later.

- **ALWAYS CHECK THE AVALANCHE DANGER FORECAST FOR YOUR REGION**
- **YOU CAN FIND THIS NUMBER BY USING THIS LINK**
- **UNDERSTAND WHAT THE DANGER RATINGS MEAN**

STEP 2 PLAN AND PREPARE

Planning and preparing for a trip must be done well before your outing. This particular step is often overlooked, but it is critical for your safety, and that of your group. First, attempt to ascertain if you will indeed be traveling in avalanche terrain. You can determine this by looking at maps, guidebooks, and by speaking with locals at sports stores, Forest Service and National Park personnel, and ski patrollers. Assuming you will be in avalanche terrain, you already know about telephoning, or looking on the web, for the local avalanche forecast. Obtain this information on the morning of the first day of your scheduled trip; however, access it prior to the trip so you can begin to identify some general trends. Begin thinking about when you should plan on leaving for the trail head and how long you'll be gone. Think about a turnaround time that gives you plenty of opportunity to return in daylight. Consider what group equipment must be brought and who will carry it — basic first aid equipment, cell phone, headlamps and even radios if deemed necessary. Will this be a short trip with friends in familiar terrain or a multiple day outing with people you don't know? What are the goals and objectives? What's the weather forecast? Topics such as creating options and group profiling will be covered later, however think of yourself as a pilot gathering pre-flight information for a cross country flight. The more you know, the less you'll be surprised and the more prepared you'll be for emergencies should they arise. The goal of the pilot is to to have a safe trip. The objective is to travel from point A to point B. This should be your goal as well – go into the mountains to have fun and return safely. This is a goal that the entire team can buy into. The objective can be what ever you think is doable, but the goal always remains the same!

CREATE OPTIONS

As you plan and prepare, consider three trip variations: your *Ideal Trip*, which may take you through avalanche terrain; a *Safer Trip*, which minimizes your exposure to avalanche terrain; and a *Safest Trip*, such as going to ski area where avalanches are controlled or going bowling — something completely safe! Perhaps there are different routes exposing you to less avalanche danger to a given destination. Research and note on your maps where these 'bail out' points are along your route. As well, people often assume that summer trails are safe in the winter. Not so! Remember that unstable snow on a slope of 30° and above can slide if unstable conditions exist. Frequently, conditions may change overnight, such as a storm blowing in or some weather event that makes your original 'Ideal Trip' through avalanche terrain unacceptable. Because you have created options you can now consider the safer alternatives instead of feeling committed to reaching the objective of your trip. This commitment factor often puts people in danger. Many accidents can be attributed to groups who had 'summit fever' and no alternatives in place on which the group could act. Consequently, when things started to get dicey, instead of aborting or changing their route, they stuck to their prior commitment and got into trouble. They had not created options. It's human nature to set an objective and achieve it, sometimes at all costs; however in the mountains in avalanche terrain the cost could be your life. Don't let it happen to you! Remember your goal is to return safely. The objective needs to be acceptable and reachable by everyone in the group. Additionally you need to have options in place that everyone has agreed to so you don't get caught up in 'summit fever!'

- **CREATE YOUR IDEAL, SAFER AND SAFEST TRIP OPTIONS**
- **RECOGNIZE 'SUMMIT FEVER' AND ITS POTENTIAL DANGER TO THE GROUP**
- **RESEARCH YOUR ROUTE AND ROUTE OPTIONS**

- **DEVELOP A START AND TURNAROUND TIME FRAME**
- **UNDERSTAND THE DIFFERENCE BETWEEN THE GOAL AND THE OBJECTIVE**

STEP 3 WHO IS COMING ON THE TRIP?

This is the part that can make or break your trip, with or without dangerous avalanche conditions. Who's coming, and can you trust your life to them? You may think, 'we're just going on a little show shoe trip with some friends, what can go wrong?' A lot can go wrong! Many people have died in the backcountry on seemingly innocent outings on snowshoes, cross country skis and snowmobiles. There are volumes of books dedicated to avalanche accident case studies, documenting what went wrong. One such publication is *The Snowy Torrents* (<http://www.csac.org/store/books-torrents4.html>).

Here are some questions to ask about the people with whom you'll be heading out:

- What is their experience and fitness level?
- What is their risk acceptance level?
- Have they ever traveled in the backcountry with skis, snowshoes or snowmobile?
If this is one of their first or second trips out, anticipate problems.
- Have you chosen an appropriate trip/objective for all the members of the group, or just for yourself?

It cannot be stressed enough that this '*human factor*' component will more than likely determine the safety and consequent outcome of your trip. Putting together a cohesive group that understands the goal and has similar fitness levels, travel skills and expectations is imperative. If you want to take out your mom for a nice snowshoe or cross country ski or snowmobile ride in some gentle terrain, it's probably best to not invite your snowboarding friend who only wants to find a cornice, build a kicker and huck! Think hard about the makeup of the group, as your life may very well depend on it. As well, consider the size of the group: the larger the group, the more things to go wrong. Unless you are going on a paid-for, guided excursion where the guide is responsible for all of the decisions, consider creating a team approach, where all the members of the party are responsible for the safety of one another. Consider everyone's concerns and observations. It's up to each individual to monitor and challenge group decisions as well as share observations. If you have concerns, observations or suggestions, it is incumbent on you to speak up! Do not be led into danger by someone who thinks they are an expert -- the avalanche does not know they are an expert! The avalanche does not know that you have a dinner date for which you'll be late for if you don't take the most direct route. The avalanche does not know your kids are in day care waiting for you to pick them up. All the avalanche knows is that when the weight of the individual or group exceeds the strength of its bonds, it fails and slides!

- **WHAT ARE INDIVIDUAL RISK ACCEPTANCE LEVELS?**
- **WHAT ARE THE PHYSICAL AND TRAVEL SKILLS/ABILITIES OF EACH GROUP MEMBER?**
- **CAN PEOPLE IN THE GROUP COMMUNICATE?**
- **CREATE A '*TEAM APPROACH*' TO STAYING SAFE**

STEP 4 EQUIPMENT

For any backcountry trip, consider what the minimum required safety equipment is: an avalanche beacon, shovel and probe. As well, pack the usual components of the *Ten Essentials*: food, water, extra warm clothes, cell phone (turned off as you travel – no incoming calls accepted, only emergency out going calls), emergency overnight equipment such as a bivy sack and a way to start a fire, and other items you might typically carry (you can split up group gear to be carried among the group). The beacon, probe and shovel are always taken into the backcountry, and the beacon is always turned on at the trail head and off when back to the car. It's not appropriate to save batteries with reasoning like, "We'll turn it on when we get into avalanche terrain." Turn it on and check each party member's ability to transmit and receive as you head out from the trail head.

Should someone in the party get caught and buried, you will need to know how to use the beacon to locate the victim, the probe to pinpoint their exact location, and shovel to dig them out. A transmitting beacon is worn by all members of the party traveling through avalanche terrain. If you're one of the lucky 2/3 of avalanche victims who do not die from initial trauma sustained in the ride down the side of the mountain at speeds up to 80 mph or more, it will be up to your party to locate and dig you out before you asphyxiate. The transmitting beacon will electronically transmit your location to people on the surface searching for you with their beacons in the receive position. Working with and understanding how your beacon functions is not something that your figure out in an actual rescue situation. A successful rescue will depend upon your proficiency with a beacon. If you have not practiced prior to going out, plan on the rescue not going so well and your wife, boyfriend, husband, friend, brother or sister dieing as you figure out how to use this thing. If on the other hand, you have practiced and practiced and practiced, the member of your party buried stands a chance of getting extracted in a timely fashion. Do not even discuss the pros and cons of purchasing a beacon. Many excellent beacons are available for around \$300.00. We will assume that you probably think your life is worth possibly saving for \$300.00?

Now that you've purchased your rescue equipment, it's critical to practice with it, especially the rescue beacon. You need two beacons for practice purposes. Ideally you will practice in snow, but if you don't have snow where you are, you can begin to get a clue how things work by having someone hide one beacon while it's transmitting and then go looking for it with the other beacon set to receive a transmitted signal. Have the hiding person get creative: hide it in the closet, under the mattress, wherever – stomp each other! Eventually you *must* practice in snow, initially burying the beacon a foot deep, eventually three feet or deeper – this is the average burial depth of victims buried in an avalanche. Don't forget to set the buried beacon at differing orientations; rarely is a beacon found exactly horizontally or vertically. Creating scenarios where you recreate an avalanche accident is the best way to 'practice'. Stomp out a good sized area in the snow and with your back turned, have your partners hide a transmitting beacon, preferably on a hillside, then see how fast you can locate the buried beacon. Mix it up: make it difficult because there's a good chance that it won't be as easy should you be involved in a real rescue. Trade places and hide a beacon for your friends. Have them work as a team and see the problems that arise. Time it and see how long it takes. Eventually bury two beacons and see what's required to locate the pretend victims. Most people will not practice. You must force yourself to get out there and do it! You have to understand the problems that can arise during a rescue and be able to react. You can only expose

yourself to this through practice. Most multi-day avalanche courses have rescue scenarios as part of the curriculum. Practice with beacon, shovel, and probe or don't go into avalanche terrain.

Note that at this point, everything that you have done up until now has been done at home (other than the beacon field practice). Your *Avalanche Danger Forecast* was obtained either by phone or via the web, your *Planning and Preparation* on your route done via maps, guide books and/or knowledge obtained from local authorities, shops and libraries or, on the web, was done at home. *Options* were determined at home through the *Planning and Preparation* phase and discussed with party members either face to face or on the phone prior to the trip. The goal and objectives were discussed as well. *Who's Coming on the Trip* was as well easily ascertained and scrutinized at home. So much can be done in the safety of your home to reduce your risk prior to potentially exposing yourself to avalanche danger. Many accidents can be avoided by simply going through the processes described above. Begin thinking 'avalanche' from the beginning and there's a good chance you won't be caught.

After all the above steps have been completed and you've ascertained that it's potentially safe to consider one of your options you can head for the trail head.

STEP 5 LOOK FOR CLUES FROM 'MOTHER NATURE'

Using 'common' and 'uncommon' sense to help you sleuth out the day's avalanche danger is a big part of the fun of being avalanche aware. This is where you become a detective. Let's start with the 'common sense' part of being a detective. Most of the relevant and easiest to gather clues to avalanche danger are provided by Mother Nature. We look for clues in the following categories: *avalanches observed*, *weather* and *snow pack*. We especially look for what we call 'Red Flags'. Red flags are clues that indicate the avalanche danger is present or rising. Case histories have shown that frequently red flag clues were present and observed by people caught and killed in avalanches. They didn't know that what they were observing were red flags or they choose to ignore them. Do not ignore Mother Nature shouting out clues! *[Note for snowmobilers: because snowmobiles are able to cover so much ground so quickly, it's important from time to time to stop your machine, take your helmet off and walk around. With the noise and speed associated with traveling on your sled, you need to stop from time to time and investigate. Often, walking around will produce collapses (whooping) or shooting cracks in the snow pack that you may not have been aware of with your helmet on traveling at speed. Both collapse and shooting cracks are signs of instability.]*

One of the most easily observable and most relevant red flags available to us is recent or current avalanches. Say you're driving to the trail head (and being the good detective that you are, always looking for clues) and you notice an avalanche. Try to determine how recent it was – the more recent, the more likely it is that instabilities still exist within the snow pack. Suppose you're heading out you actually see an avalanche happen, or you hear from someone else in the parking lot that saw one happen? How big was it – big enough to bury or injure you? Where did it happen? What triggered it? Did it occur naturally? Was it triggered by a human? If avalanches are running naturally or look like they've run recently, or are being triggered by humans, this is one of the brightest red, red flag clues that Mother Nature can provide you. This is the one clue that is telling you loud and clear to reconsider your plan and consider your safer or more likely, your safest option now!

In addition to nature's warnings, there are also weather **red flags**. One relevant **red flag** is lots of new snow, on the order of an inch per hour or more, coupled with winds that are moving snow. This combination can potentially stress the snow pack close to its breaking point. You or someone in your party could be the proverbial straw that comes along and breaks the camels back, so to speak. It's safe to say that during and immediately after storms that the avalanche danger is often at its highest. The snow pack has not had time yet to adjust to the new load. Give it time before rushing out and hitting the steepest slopes around. Rain and/or warm temperatures (32°F. and above) can weaken the bonds in the snow pack as well. Intense solar radiation on sunny days can heat up the snow pack on sunward exposures, weakening bonds as the day goes on. All these weather related **red flags** can contribute to slope instability.

Lastly, there are snow pack **red flags**. The snow pack is the snow lying on the ground. It comes down as individual snow flakes over the course of the winter and the different storms form different layers. Sometimes those layers bond well and sometimes they don't. Simply put, it's these layers with their different strengths and weaknesses that create avalanches. We can obtain clues about the snow pack as we travel over it, seeing shooting cracks or hearing loud whoomps resulting from our weight on the snow, causing the collapse of weak layers below us. An abundance of shooting cracks and whoomps are **red flags** that are telling us that there are possible instabilities within the snow pack, and that it could potentially slide.

As you go along during the day, constantly look for clues, constantly updating your own personal avalanche danger evaluation. You may have obtained the danger rating from the forecast center, but you need to do some evaluating on your own as you go along. There is no clear number of **red flags** that need to be present, but obviously the more **red flags** that pop up the more you need to err on the side of caution, exercising common sense and considering your options at all times.

- **KNOW WHAT 'RED FLAGS' ARE**
- **KNOW THAT MOTHER NATURE OFTEN TIMES PROVIDES OBVIOUS CLUES**
- **CONSTANTLY UPDATE AND RE-EVALUATE**
- **WHEN UNCERTAIN, INCREASE YOUR MARGIN OF SAFETY**

STEP 6 TERRAIN EVALUATION

Will you be traveling in avalanche terrain? Avalanches most often occur on slopes of 30° - 45° or more but can start on slopes as shallow as 25° and as steep as 50°. You must be able to identify when you'll be in avalanche terrain. You can learn how to measure the slope angle with an inexpensive slope meter available at most sporting goods stores. If you wish to eliminate your risk all together, plan your trip so it never intersects with slopes of more than 25°. However, just because you are in the middle of a valley on virtually flat terrain does not eliminate your risk if slopes above you are 30° or more and contain an unstable snow pack. Avalanches can be triggered from below and can run great distances. Be aware of this danger when you are down on the valley floor – look for signs of instability from Mother Nature and put distance between yourself and the slopes above. Classic avalanche paths are readily identifiable as big swaths cutting down through the trees. Often paths can be identified as having broken or damaged trees and vegetation. As you travel above tree line however, the paths become less defined and harder to identify. It's often smaller, undefined avalanche paths both above and below

tree line that catch people. It is often reasonable and appropriate to travel in avalanche terrain. When we do so, however, it is wise to always look for the best routes to travel and the terrain where, if something should happen, you have the best chance of survival. Be aware of terrain traps like gullies and road cuts where if the snow slides it can pile up deeply on top of you. Leeward slopes, where the wind had deposited snow while often times offering the softest and deepest powder, may also be suspect, particularly right after a storm. The fact is that avalanche terrain is easy to identify, particularly if you buy and learn how to use a slope meter. By recognizing avalanche terrain, you can avoid it as the danger dictates.

- **LEARN TO RECOGNIZE AVALANCHE TERRAIN**
- **BUY A SLOPE METER AND USE IT**
- **BE ABLE TO IDENTIFY DEFINED AND UNDEFINED PATHS**
- **AVOID TERRAIN TRAPS**

STEP 7 TRAVEL SMART AND COMMUNICATE

You're at the trail head and ready to get going! The packs, the skis, the snowshoes, the snowmobiles are out of vehicles and off of trailers, and people start getting ready, perhaps figuring out what they left behind. Always bring extra items in the car such as water, sports bars, and clothing. An extra beacon is also a good thing to carry with you. On that note, start out by checking each others beacons to make sure they are all functioning correctly. You will be surprised how many potential problems this practice will turn up. That's why having extra beacon batteries with you is also a good idea. Always do this at the trail head so you can drive back to get the stuff you've forgotten! At the trail head, talk to people to see what they know about the area – have they seen any avalanches recently? Any place they might suggest avoiding or other information they could offer? As you approach potential avalanche terrain, always try to travel on the shallower slopes available to you. Work onto the steeper slopes slowly, checking for clues from Mother Nature along the way, asking for feedback from your travel partners. As you encounter potential avalanche terrain, travel through it quickly, one at a time, thereby stressing the slope a little at a time rather than all at once. Always make sure that only one member of your party is exposed at a time, giving the rest of the party the ability to act as the rescue party should something go wrong. Travel above and around avalanche terrain when possible and when traveling through avalanche terrain, ask yourself – 'what would the consequences be should something slide here? Can I get out easily?' Typically there is no easy out; however, being on the side of potential avalanche path is better than being right in the middle of it. Route finding along shallower areas of slopes and off to the sides and on ridges is recommended. As you route find, stop and regroup, adjust your speed to the slowest group member, don't get out of site of one another and never send someone back alone should they tire or have equipment problems. Communicate: ask how everyone is and what they think of the trip of so far. Has anyone seen or heard any signs of avalanche? Resist the urge to race to the top. Take your time and enjoy the group of friends that works well together in the backcountry. And never travel alone in the backcountry. Should you get buried there's no one to dig you out!

- **CHECK BEACONS AT THE TRAIL HEAD**
- **GRADUALLY MOVE INTO STEEPER TERRAIN**
- **USE SHALLOW TERRAIN AND RIDGE LINES**
- **NEVER TRAVEL ALONE**
- **COMMUNICATE AND KEEP EVERYONE IN SIGHT**

STEP 8 DECISION MAKING

What actually are we doing when we make a decision? We might define ‘decision making’ as examining, choosing and carrying out options. Fortunately, we’ve got options in place because there are so many variables that can pop up once we start on a trip. One thing is very clear: decision making starts the very minute you begin to think about the trip and does not end until you and everyone in the group has reached the goal of safely returning from the trip.

When traveling in avalanche terrain there are often – sometimes mostly – no simple, clear answers to questions we may ask. The weather conditions, terrain, people, and other factors make each situation unique and require creating a number of options that may work. Decision makers have to sift through these options and choose those that are the best fit given the various factors at play, and then carry out those options to the best of their ability.

Most importantly, it is essential to keep updating information and revising opinions while following through on a decision. The snow, weather, people, and other factors are not static, and because these factors are in a constant state of change, the decision that was originally made may become less optimal as one travels in the backcountry. A decision that was appropriate in a given place yesterday may be quite inappropriate at the same place today. Making a decision, then sticking to it regardless of common sense, obvious signs, and new information is an accident waiting to happen.

There are few right answers. There are, however, usually a number of answers that are right enough. The trick is to recognize which answer is right enough and follow through without missing something that is telling you to reassess your situation.

Given the fluidity of the problems and the flexibility required, how does one, especially someone with less experience or training, make a reasonable or right enough decision? The solution is not to strive for the right answer but to be able to ask the right questions. Think about asking the right questions as we’ve talked in the other Steps, and then attempt to make your best decision.

Remember the notion of using ‘uncommon sense?’ That’s the sense that allows you to see things differently than you might see them if you were thinking with common sense. Here are four things that often accompany avalanche accidents where people thought they were using common sense, and it got them in trouble, because it may have been more appropriate to have been using ‘uncommon sense.’ Some educators refer to it as ‘thinking like an avalanche.’ Others talk about it in terms of ‘city think’ vs. ‘mountain think.’ Whatever you wish to call it once you head into the mountains, things aren’t always as they appear!

- *Commitment.* Committing to a peak or any given objective without agreed upon options should be avoided. Commit only to your goal of having a safe trip. As humans we want to commit to our objective and strive mightily to fulfill it, to show what we’re made of, but in the mountains Mother Nature doesn’t care
- *Herd Mentality.* Everyone else is going out, why not us? That doesn’t make it safe. Make your own decisions based on information you’ve carefully gathered and accessed. Continually update that information throughout the trip, start to

finish. Just as seeing a restaurant full of people causes us to think, ‘This must be a good place,’ doesn’t always work out that way.

- *Familiarity.* Just because you’re familiar with an area and you feel safe there or have never seen an avalanche there before does not necessarily make it safe. If there is a slope steep enough to slide with unstable snow on it, it could be triggered naturally, or you or someone in your party, or maybe not in your party, could trigger it. Familiarity breeds complacency and complacency is not a good thing in avalanche country.
- *Scarcity.* ‘The powders going to get all tracked up if we don’t get there first!’ are some famous last words. Or ‘This is our only day off; we’ve got to get out there!’ Thinking that we’ll never get another chance at something makes us greedy and often times makes for unreasonable decisions.

Those four situations above are examples of when we need to use our ‘uncommon sense.’ ‘Uncommon sense,’ when combined with our ‘common sense,’ can be a powerful tool in the backcountry.

- **BEFORE LEAVING: OBTAIN CURRENT AVALANCHE BULLETIN AND FORECAST**
- **WHILE TRAVELING: OBSERVE CLUES FROM MOTHER NATURE THAT HAVE AFFECTED OR INDICATE SNOW STABILITY**
- **BEFORE ENTERING AVALANCHE PATHS, ASSESS CONSEQUENCES AND APPLY APPROPRIATE TRAVEL TECHNIQUES**
- **CONSIDER HUMAN FACTORS THAT INFLUENCE THE DECISION MAKING PROCESS**

Special note for snowmobilers: when high marking make note of the following precautions;

- High mark only when you know conditions are stable. Understand that this is an inherently dangerous attack of man and machine directly into the path of an avalanche.
- High mark one at a time and ease into the terrain beginning with shallow slopes.
- Park out of the runout path of the avalanche; if uncertain, keep machines running pointed away from the path.
- Keep an eye on your partner up in the path.
- Should someone get stuck, do not go up into the path to assist with getting your partner unstuck. Time after time this is proven to be associated with snowmobile related avalanches and deaths. The more weight you put on the slope, the more likely you will exceed the strength of the snow pack. Be vigilant as this is most often when stuck snowmobilers penetrate into deeper unstable layers in the snow pack and trigger avalanches.
- Never ride above your partner and do not stop in the avalanche path.
- If caught and buried snowmobiles are often found upslope of their machine in roughly the same trajectory.

You've done your absolute best to keep yourself and your party safe, and there's a very good chance that by following the steps above that you will be able to stay safe. Expect the best but be prepared for the worst!! You've got beacons, probes (not ski pole probes, but dedicated probe poles), and shovels. Each person has this assembly in their pack. If something does go wrong, you're prepared!

When encountering potential avalanche terrain, prepare to cross it one at a time. Make sure the group is positioned in such a fashion that if an avalanche is triggered, only one person could possibly be caught. This leaves the rest of the party available for rescue. The main party always watches the person crossing quickly through potential avalanche terrain. Should the person get caught, note in your mind as well as using terrain features where you last saw the person prior to them getting caught. Usually the victim is somewhere below this 'last seen point.' At this point things get crazy and you or someone has to take control of the situation. Firstly, is the area safe for the rest of the party to get into in order to search, or is there still existing avalanche potential that might threaten the rest of the group? After ascertaining the safety of the rescuers, it's best to have a leader who directs the effort (assuming there are multiple rescuers). This leader makes sure that beacons are all on receive and assigns who will perform a transceiver search, who will probe, and who will shovel. Speed is essential: the rescue must proceed at a fast pace as anyone buried (assuming they haven't died from trauma) is running out of air. Scan the area for clues on the surface: is there a glove, ski pole or pack visible? Go over and pull on it, probe around it, check it out. People have been known to leave the scene of an avalanche accident to go for help only to have the rescuers return, pick up a glove and find a hand inside. By then the victim is, sadly, dead. You are the rescue party, do not consider leaving the scene until you've done all you can do to find and dig out anyone caught, *fast*. Once you leave for help, you have to say to yourself that this is now a body recovery.

As a victim, if you're caught, yell out and try to exit the side of the avalanche. Leave your pack on if it's a day pack as it has your rescue equipment and may protect your back. If you have a very large multi-day pack, you might consider loosening the straps when crossing potential avalanche terrain and dump it if you get caught. Let go of ski pole straps and kick off skis, board, snow shoes if possible, they can potentially drag you down. If you can't get out, try swimming motions, and fight like crazy! When you come to a stop, attempt to make an air pocket with your hand in front of your face and try to thrust a hand toward the surface. Now hope someone is left on the surface with a beacon, shovel and probe and know how to use it – they are your only hope of survival.

These survival tips are all rather hypothetical as the avalanche will most likely have its way with you and it won't be kind. These are brutal forces of nature that you're dealing with so don't expect to be able to affect the outcome once you're caught. The best way to get a better handle on rescue is to take an avalanche course that has field rescue days.

New and better rescue equipment is becoming available all the time. Most beacons are now digital in nature, there are Ava-Lungs which enable you to breathe once buried, and the AirBag Backpack systems that inflate in an effort to keep you afloat once caught. These are not talismans that empower you nor are they guaranteed to keep you safe. Using these devices does not enable you to take greater risks.

Now you're set, ready to go into the backcountry, you've got everything you need with you. WRONG! At the most it may have taken an hour or two to read through this. Avalanche education is a lifelong endeavor and what's more, it's learned experientially; in other words, you need to get out there and do it, preferably a little at a time, always thinking of erring on the side of safety rather than pushing the envelope. Think of this guide as having just read a book on learning to play guitar, it's going to be awhile before you can jam with B.B. King. Think of avalanche education as learning how to swim: you start off in the shallow end of the pool and very slowly, over time, head toward deeper waters. You learn the skills before you dive off the high board. Most of the time it's safe to travel in the backcountry and it's great fun. Learning to recognize when it's not safe is your job! Safety mainly becomes a matter of choosing the right terrain for the conditions.

Many people have honed their riding/skiing skills at ski areas and can negotiate difficult terrain with ease – problems arise when their skiing/boarding and snowmobiling skills outpace their avalanche skills. People get out in the backcountry (either by hiking or snowmobiling or through ski area access gates), see awesome, steep and untracked powder slopes and want to rip it up. Other groups drawn to the backcountry are on snow shoes or are cross country skiers, it's an easy and fun way to enjoy the outdoors in winter. Also, snowmobiles have seen a great increase in popularity and many of these folks (leading the avalanche death numbers in North America as of late) are getting killed as a result of not being educated about the dangers of avalanches. Of course there are other user groups, including experienced and avalanche aware backcountry users that get caught as well, but the fact is, this guide is not for them. They recognize and accept the risk associated with backcountry travel and even they are capable of making mistakes. It's like driving a car: you buckle your seat belt, drive defensively and still, accidents happen. Awareness is the first step, and you've taken it. It's also recognizing when you've perhaps set an objective or chosen travel partners that aren't quite right. This guide has provided you with some good tips, ideas and insights into what to look for in the terrain, the weather, and the snow pack but most importantly what to look for in yourself and the people you'll be traveling with and the decisions you make. You now have some information, you cannot plead ignorance anymore. Get out there and take a class, preferably a multi-day course with time spent in the field with specialists that can show you how to route find, answer questions and reinforce what you've learned here. This is a big part of the joy of the backcountry, you're always learning. Don't be fearful of avalanches – respect and understand them and you'll have lots of fun in the mountains.

Information on avalanche courses: <http://www.avtraining.org>

General avalanche information: <http://www.csac.org>
<http://geosurvey.state.co.us/avalanche/>
<http://avalanche.org>

Video: http://www.bdel.com/gear/backcountry/avi_vid.php

The author would like to thank the following people and organizations as being of assistance and inspiration not only for this paper but over the years: The American Institute for Avalanche Research and Education, The Colorado Avalanche Information Center, Ian McCammon 'Evidence of Heuristic Traps in Recreational Avalanche Deaths' ISSW 2002, Karl Klassen, Doug Fesler, Jill Fredston.