Backcountry Avalanche Rescue Reference

This document is part of "Decision Making in Avalanche Terrain: a fieldbook for winter backcountry users" by Pascal Haegeli, Roger Atkins and Karl Klassen and provides in-depth background information for on the topic of Backcountry Avalanche Rescue. For additional background information on the topics covered in the field book visit www.avalanche.ca/cac/decisionmaking

It's always best to avoid the need for avalanche rescue through good travel skills and judgment because avalanche rescues are frequently unsuccessful even in the best circumstances. Given the rapid decline in survivability of those buried or severely injured, if an avalanche accident occurs in the backcountry the people already at the scene must be prepared to locate anyone caught in the avalanche, dig them out, and stabilize life threatening injuries without waiting for outside help to arrive. After the initial response by people at the scene of the avalanche, additional outside help may be required to complete the rescue, to provide medical support, and/or to evacuate people who are not able to travel on their own due to injury or lost equipment and, in Canada, this is generally the role of an organized rescue effort.

The police of jurisdiction are the responsible authority for search and rescue operations. In most cases this is the RCMP, but in some jurisdictions this is parks authorities or municipal police.

The appropriate procedure to call for outside help in the event of an avalanche accident varies with the region and the land use jurisdiction on which the accident has occurred. Prior planning is required to make a call for outside help as efficient and effective as possible. The following provides an overview for making plans to call for outside help. Note that these are general guidelines, not hard and fast rules. The people most likely to survive wilderness accidents are those who are able to adapt guidelines to the specific situation, not those who strictly follow rigid protocols.

Making Contact

It is recommended that backcountry recreationists carry a device for two-way communications such as a cell phone, satellite phone, or VHF radio. Various systems have different capabilities and limitations and different systems may be more appropriate in different locations or scenarios. Which system is most appropriate requires some research into what kind of communications network is available in the

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area where the trip is being undertaken. In addition, a 406 MHz personal locator beacon (PLB) that can send a distress signal via satellite communications is recommended in all cases.

Communications from the backcountry can be difficult. Regardless of the form of communication used, in the mountains it is often necessary to move to a different location, usually on higher ground and away from dense forest cover, to make contact. Prior to your trip, prepare a friend or family member not participating on the trip with instructions about how to notify authorities and pass on information that will aid rescuers in finding you should help be required. This person can initiate a rescue if you are overdue, may be easier to contact that the authorities, and may be able to assist the authorities with information about your group, your location, and your predicament if direct communication with authorities is compromised.

Know the phone number(s) of the appropriate rescue authority to call in case of emergency. This will vary with the region and land use jurisdiction. Outside of national parks, the recommended way to notify search and rescue authorities of a backcountry emergency is by calling 911. In national parks, the recommendation is that a call for rescue be made by calling the park dispatch number directly via cell phone or satellite phone if possible.

Calling 911 will put you in contact with a centralized dispatch centre used primarily for front-country emergencies. It is important to tell the 911 operator that this is a backcountry avalanche emergency requiring mountain search and rescue (SAR) and to inform them of your location. When you inform the 911 operator of your location and call back number, they may then patch your call through to the correct agency to coordinate a rescue, usually the nearest RCMP detachment or the parks dispatch office for the area.

The 911 operator will ask you to stay on the line, which may not be practical in the backcountry if battery power needs to be conserved. After communicating priority information, you may need to make arrangements for being called back if possible.

If you are in a national park and attempt to call 911 to arrange a rescue, tell them that it is a backcountry avalanche emergency, which park you are in, and that a parks backcountry rescue is required. The 911 operator should then patch you through to the parks dispatch.

In addition to 911 and toll free emergency numbers, compile any available direct-dial phone numbers that allow you to directly access emergency and search and rescue services for the area of travel.

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While 911 service is available in much of Canada it is still not available in many remote areas. In remote areas where 911 Service is not available, knowing alternative emergency numbers is required. Local emergency numbers can be found inside the front page of most phone books.

If calling 911 or the local number puts you in contact with an operator or agency that might be unfamiliar with avalanche or mountain emergencies, you need to be prepared to provide guidance in regards to what resources you need and perhaps even where those resources might be obtained.

Cell Phones

Know the areas where cell coverage exists, cell phone service is often limited to areas near transportation corridors and population centers and may be inaccessible from the backcountry. Turning on the GPS/GSM function on the cell phone can help rescuers pinpoint your location.

VHF Radios

If VHF radio coverage (e.g. ham operator or commercial frequencies or repeaters) is available in the area of your trip, bring a radio programmed with the appropriate frequencies and be aware of the areas where the radio will and will not reach outside help. Some advantages of radios are that there may be multiple people or organizations that might hear a distress call and a very rapid response may be possible if a helicopter or other knowledgeable parties are already operating in the vicinity. In coastal areas, a radio programmed with marine emergency channel 16 could be used to alert authorities of your situation.

Personal Locator Beacons (PLBs) and Satellite Enabled Notification Devices (SENDs)

Recent technological developments provide new and effective options for sending alerts in case of distress. Personal locator beacons (PLBs) with worldwide coverage operating at 406 MHz have become available in recent years. PLBs can send a distress signal to notify search and rescue authorities, but do not allow two-way communication. For best results with a personal locator beacon, use a device that includes GPS (global positioning system) capabilities and register and maintain your profile on-line prior to starting your trip. The online profile includes information such as the number of people in the group, the planned activity, the expected return time and the situation that might cause an alert to be sent. After the initial cost to purchase a 406 MHz PLB, there are no ongoing costs for registering or monitoring these beacons. Register Canadian beacons online at canadianbeaconregistry.forces.gc.ca. When using a PLB in another country, it is necessary to register the PLB in that country as well.

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There are also a number of devices similar to PLBs known as Satellite Enabled Notification Devices (SENDs) that are now available. Some SENDs have functions to cancel a distress call if situation is resolved and/or to extend overdue time if the cause of delay is not an emergency. There will soon be devices available that include the capability of two-way texting as well as functioning as a distress signal beacon. SENDs are monitored as a commercial service with ongoing subscription charges.

Satellite Phones

Before relying on a satellite phone, be aware that satellite phone coverage is not universal. The coverage area depends on the company providing the service, the location, and the time of day. Satellite phone providers have websites that show the timing of optimal coverage for any given area. Satellite phones generally require the use of an area code, and therefore cannot access 911 services. Toll free numbers may also be inaccessible via satellite phone. When using a satellite phone it is necessary to use direct-dial numbers to alert local emergency and search and rescue services. It may not be possible to reach local authorities directly because many police detachments do not always have personnel available to answer the phone, and you may be directed to call 911 for emergencies even if you do reach the local authorities. It is a good idea to have phone numbers for someone that you can call and ask them to call 911 for you, especially if you are using a satellite phone.

Mountain Distress Signals:

Although it is easy to see a helicopter from the ground, it can be more difficult to locate people on the ground from a helicopter. Make yourself as visible as possible to help rescuers to locate you.

The following recognized arm signals indicate to rescuers whether you need help or not; do not wave your arms:

Recognized mountain distress signals based on groups of three can be used to get the attention of rescuers. A signal can be anything visual (three fires or piles of rocks in a triangle, waving a bright cloth flag three times or three flashes of a light or signal mirror in quick succession followed by a one minute pause) or audible signals (shouts, whistles,

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etc). Stamping out a large "SOS" or "HELP" in the snow in an open area is also a recognized signal of distress.

Communicate Priority Information First:

If a connection is made, it may be of poor quality and may be lost at any time. Therefore it is important to be prepared with a concise and clear statement with the priority information required to dispatch a rescue. The minimum information needed to initiate a rescue effort is the fact that help is needed in the backcountry and where it is needed, so this information needs to be communicated first. Priority information is as follows and should be communicated in this order:

- **Backcountry Emergency!**
  "There is a Backcountry Avalanche Emergency requiring Mountain Search and Rescue."
- **Who are you?**
  Briefly state your name, the type of activity of the group you are with, and that you need help:
  "This is John Doe with a ski touring group and we need help."
- **Where is the Accident Site?**
  Give the name and/or a brief description of your exact location, followed by map coordinates if possible. National Search and Rescue Association standards use latitude and longitude in decimal degrees for coordinates, but UTM grid references can also be used. If speaking to a 911 operator, be sure to include the general location such as the name of the park or the name of a nearby town.
  "…near the town of Whitewater, BC on the North side of Round Mountain at 52.125 degrees North and 117.506 degrees West."
- **What has occurred?**
  Give the type of accident or emergency, the number of people requiring assistance, and the seriousness and type of injuries.
  "There has been an avalanche and two people are injured. One has chest pain from a bruised chest and has difficulty breathing. The other appears to have a broken leg and cannot walk."
- **When did it occur?**
  "This happened 15 minutes ago."
- **Who is on the scene and what has been done about it?**
  "We are a group of six in total, including an ER doctor. Three people were buried

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in the avalanche and we were able to locate everyone and dig them out. The doctor is monitoring the condition of the person with an injured chest and we are putting a splint on the broken leg."

- **What are the weather conditions at the accident site?**
  Provide a description of the weather conditions for flying in the vicinity of the accident site (especially visibility and wind).
  "We have high scattered clouds with good visibility at the accident site. There are light winds from the north."

- **What do you intend to do next?**
  The dispatcher may ask you to stay on the phone and be patched through to the rescue coordinator. Be prepared to tell them what you intend to do next. You may also be given advice and/or instructions about what you should do next.

Additional Information:

In addition to the priority information, be prepared to provide additional information as required, including:

- If possible, the number where you can be called back if the connection is lost or if you need to break off the connection to conserve battery power.
- An assessment of possible helicopter landing sites nearby but not exposed to any avalanche risk. It is important to let them know if you think that a helicopter can land and shut down immediately beside any injured people or if it will be necessary to travel even a short distance to reach them, because this will help determine what resources are needed.
- An assessment of the rescue resources that you think will be required. For example, will a long-line sling rescue be needed, will advanced life support be required, etc.
- A description of the terrain and travel conditions at the accident site (forest cover, steepness of terrain at the accident site, deep snow conditions, etc)
- Gear available on site (for rescue, evacuation, and first aid)
- Color of clothing/distinguishing features of group.
- The number of people in the group and their skill level (mountain skills and medical skills)
- Preparedness to spend the night out if necessary.

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- Ability to travel and method of travel.
- Vehicles and where parked.

What response can a person expect if a call for help is made?

This depends on the level of service available for that location. In popular and heavily travelled areas such as Banff National Park, helicopters, pilots, and wardens are on standby and a rescue might be initiated in as little as 30 minutes. This can take longer depending on weather and time of day. In remote areas, it may take days to get a helicopter on site and there are fewer resources in terms of equipment and skilled personnel available for a rescue operation.

When a distress signal is detected from a 406 MHz PLB, local search and rescue authorities are notified within minutes. However the elapsed time before help arrives on site can be significant, depending on weather conditions and the location of the accident in relation to the location of the rescue resources.

Prior to making a backcountry trip, it is advisable to research the local search and rescue capabilities to get an idea about what response times are required to mobilize a rescue. For domestic rescues, the authorities' target is to mobilize a rescue and make contact within two hours. If a call for a backcountry rescue is made, the available search and rescue team will come to help you when and how they can, but the time required can vary greatly with location, weather conditions, time of day, availability of aircraft, and severity of need.

In some circumstances it can be very difficult or impossible for local search and rescue groups to reach the accident site. For example, few helicopters can operate effectively above 14,000 feet and acclimatized rescue personnel may not be available even if there is access to a high-altitude helicopter. In this situation, it may be necessary to move to a lower elevation before rescue is possible.

Rescue Costs:

Backcountry rescues can be costly, but in most cases there are systems in place to cover these costs. Do not hesitate to call for help out of concern for the potential costs.

FILE VERSION

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Mountain travel is dangerous and can involve exposure to avalanches and other hazards. The advice and decision guidelines provided in this field book cannot eliminate these hazards, but they can help you understand and manage them. This field book is no substitute for training, experience, and choosing skilled and responsible travel partners.

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