



Search and Rescue for Outdoor Leaders

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Mountain Rescue Association

Education Committee

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An introductory program in search and rescue operations for experiential programs.

About the Author

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The author of the Mountain Rescue Association's *Helicopters in Mountain Rescue Operations* and *Avalanche Rescue Operations* manuals, Charley has consulted rescuers, mountain guides and climbers throughout the world, from Kazakhstan to Sweden, from Kilimanjaro to Aconcagua. Charley is a frequent speaker at meetings of the Wilderness Medical Society, the Mountain Rescue Association, and the International American Technical Rescue Symposium.

Search and Rescue for Outdoor Leaders

Objectives

The Mountain Rescue Association (MRA), a volunteer organization dedicated to saving lives through rescue and mountain safety education, has developed this “Search and Rescue for Outdoor Leaders” program. Although these materials are valuable for individuals, they are largely developed for experiential education programs that may be required to respond to a search and rescue emergency.

Introduction

The recent increase in participation in outdoor adventure programs has brought with it an increased need for outdoor leaders with skills in search and rescue (SAR) management. Although accident rates among experiential programs are consistently lower than the rates among other users, experiential programs cannot eliminate accidents altogether. It is therefore critical that such programs work to integrate rescue response into their outdoor adventure program.

When it comes to search and rescue emergencies, time is of the essence. The clock starts ticking the moment an emergency is identified, and the longer the clock ticks, the greater the risk to all involved. It is during this initial stage that a pre-plan helps lay a framework for the management of the emergency, and a resource management plan creates a structure for the organized response.

This program is broken into 3 major elements:

- Emergency Response Plans
- Search Theory and Response
- Rescue Response

The 2 disciplines of search and rescue are as distinctly different as their names. While the search response is still an emergency, it is arguably easier than the rescue response and relies more on management skills than on hands-on technical and medical skills. The rescue response, on the other hand, is fully dependent on the hands-on skills of the participants. No amount of management skill will make up for a lack of technical/medical skills in a rescue of an injured party.

Emergency Response Plans

Before any outdoor leader can develop a search and rescue plan, they must address the issue of pre-plans - an essential element of any emergency response. Much has been written about Emergency Response Plans (ERP's) for outdoor leaders. Listed below are a few relevant factors that should be considered concerning search and rescue operations.

Personnel

The human resource is most important resource in your ERP. Developing layers of responsibility and management helps assure the smooth implementation of any SAR response.

In any rescue situation, you will likely find yourself with instructors who have been trained in the emergency response. But you will also have program participants who are able to assist. How many students are in your program, and what briefing did they get before the program started? What is their state of mind at the time of the accident? What is their experience level and reliability? These individuals might prove to be a valuable resource.

Unlike search and rescue teams, whose sole responsibility is to provide SAR services, the experiential leader must consider the current field activities as well. Some people in the emergency response plan may be responsible for elements unrelated to the search or rescue itself, but critical to the management of the field operations and personnel involved. The program leader must assess the planned field activities and make any adjustments that are necessary.

Equipment

In their pre-plan, managers must consider the location, time of year, terrain, and possible emergencies with each outdoor program. All programs are different, and it is important to have the right equipment for the terrain and season. For example, does your supply list include the equipment necessary to improvise an evacuation litter? Are your radios capable of communication on the frequency of the land manager or law enforcement group?

Medical protocol

A medical pre-plan is also essential, including a list of medical protocols. What is the chief medical officer authorized to do in the field? When does a medical emergency require notification of higher authorities? A qualified ERP addresses these issues.

Relationship/Communication with Local Agencies

A communication plan is essential to any emergency response. Do your field leaders have radio communication with the land manager or another authority? Who are the authorities in the area where your field activities take place? When possible, spend time with the land manager and law enforcement officials discussing your plan. Knowing how to contact the local search and rescue team is important, and valuable time is lost if you have not already established communication guidelines, including a full list of radio frequencies and where there are radio "dead spots" at your field locations. In addition, knowing the local SAR resources will help you understand their abilities and their limitations. This will help you in your decision-making in the field when an emergency does occur.

Using "Runners" for Communication

In the absence of field radios or mobile phones, your Emergency Response Plan must make provisions for runners to communicate any emergencies to the local authorities. Your ERP should

include a checklist of what information those runners should have when they leave the accident site.

When runners are utilized, they should:

- Always travel in groups of 2 or more,
- Take a clearly marked map,
- If the accident is off-trail, flag the route from the location to the trail they utilize,
- Have the 10 essentials to avoid complicating the situation.

Search Theory and Response

To the outdoor leader, preparing for and managing the search response is much different than preparing for and managing the rescue response. The one thing the two have in common, however, is the need for an established and well-documented pre-plan.

Experiential Programs' need for a Pre-Plan

"A number of lost student incidents have been unnecessarily aggravated because students did not know what to do when separated from the patrol or instructor."

Colorado Outward Bound School's Course Director Manual

To understand effective search, we must understand behavior of lost persons. Hopefully you have modified your program briefing to include discussion on "what to do if you get lost." If your pre-plan establishes an expected behavior for any group member who becomes lost, you have just increased your search effectiveness a hundred-fold over SAR teams who are searching for a lost person who had no such briefing. "Stay put" is the most important lesson you need to give your program participants. Unless there is imminent threat of life or limb, any lost person is better off if they do not move. This will keep the search area small.

Common Lost Person Strategies for Getting "Unlost"

So your student KNOWS he or she is lost - and that the rest of the group will initiate a search fairly quickly. You have already instructed your participant to stay put. So they will stay put, right? Don't count on it. Most participants will also come equipped with an ego, and that ego may tell them to rescue themselves. For this reason, it is helpful to understand lost person behavior.

A summary of studies on the behavior of lost persons includes:

- If a lost person finds a trail, they might get on it and run like hell - convinced they're on the way back to their last point, when in fact they might be running FROM it,
- Rarely will a lost person reverse their direction on a trail,

- Many people ignore trails and follow their own logic - traveling in a straight line. They figure they'll come to a road or highway - not expecting the cliff or impassable river that ultimately confronts them,
- Some lost people will climb/hike to the top of the closest hill to get a better view, only to find that the trees atop that hill obstruct any view,
- The majority of lost people will travel downhill and/or downstream,
- Those who travel downstream will likely end up in a swamp or impassable confluence long before they reach civilization,

Other noteworthy behaviors include:

- Many lost people will travel at night - even without a flashlight,
- Most lost persons will stay on a trail if they're not absolutely sure of the right direction,
- Lost people will rarely move around randomly - they usually move with conviction and hope that they're heading in the right direction.

Participants in outdoor programs may behave differently when lost. In particular, they are probably better equipped than most, presumably with ten essentials or some survival equipment.

Mental/Emotional Aspects of the Lost Person

If the subject is a course participant, consider the mental and emotional state of that participant. If there is a chance the subject is despondent, your search strategy should change accordingly. Despondent subjects react with a different kind of lost behavior, largely because they are a different kind of "lost."

A search for a despondent and/or suicidal subject must be considered an emergency – ALWAYS. They generally do answer searchers' calls, may try to hide, often die from exposure, since they do not have the natural tendency to protect themselves from the elements. Suicidal subjects usually do not travel far - but almost always to a scenic location where they can sit and meditate.

If yours is a youth program, keep in mind that 50% of adolescents seriously consider suicide before adulthood. Females are more likely to threaten suicide, but males are more likely to succeed.

How searches for despondent subjects be handled differently? In particular, searchers should:

- Not underestimate the emergent nature of the search,
- Increase the saturation of the searchers, and rely less on audible search and attraction techniques,
- Expect that the subject might not travel as far as a typical lost subject,
- Consider whether the subject headed towards a checkpoint or resupply point,
- Be prepared to offer emotional support to the subject when the subject is located; this is a critical time for support and understanding.

When a despondent subject is missing, outdoor leaders should immediately contact the program leader, who should further contact the family.

The First Few Hours of a Search Operation

"Urgent response to a lost person incident reduces the size of the search area"

"Managing the Lost Person Incident" by National Association of Search and Rescue

Hopefully, your outdoor program's carefully developed pre-plan includes emergency resource lists and call-out procedures. While some programs suggest that leaders should not notify authorities until they have conducted their own search for a specified period, others suggest immediate notification of authorities.

The Mountain Rescue Association, representing thousands of rescue mountaineers nationwide, does not charge for its services. Since SAR professionals are generally volunteers, and in many cases know their response areas quite well, it is prudent to call them as soon as any SAR response is activated.

Little is lost when calling for help. A search area expands exponentially with each hour a person is lost. Call for help - even if you end up not needing it.

Search Methodology

A participant is overdue. You have assembled your participants and are ready to respond.

What's next? The first (and often neglected) step in any search is to gather as much information as possible before sending other participants into the field:

- Who is missing, and since when? What is his/her experience level?
- What was the last seen point?
- What did they have with them? Food/clothing?
- What was their emotional state of mind?
- What type of footwear/what is the sole pattern? Is there a sample footprint available?

Once you're ready to initiate a search, assembling your staff and students means assessing their condition, abilities, and resources. What other resources do you have? Are other programs in the vicinity that you can call on?

Some basic search techniques will help:

- All search teams must be at least 2 people,
- When possible, use staff as the team leaders. At the same time, let the students play active roles. This is a tremendous learning (and growing) opportunity for your students.
- If your program is near a road, have someone search the roads by vehicle - driving slowly and honking the horn 3 times periodically.

Hints for basic search technique include:

- Start documenting early. The person in charge of documentation should clearly mark search assignments and departure times on a map,

- Designate the search areas with the highest probability and send searchers there immediately,
- Communication between search teams is essential. Be certain that each field team has a radio,
- Start a "hasty search" early on - have people run the trails and streams, etc., carrying a whistle and periodically stopping to blow it 3 times,
- Periodically, request check-in with each team (including their location),
- The base camp might be a good location to practice attraction techniques - build a smoky fire, make noise, honk car horns, etc.,
- Communication between search teams is essential. Be certain that each field team has a radio,
- When search teams return from an assignment, ask them how successful they felt they were in their efforts... some may surprise you with, "not very, the brush was very dense,"
- As soon as possible, a "scent article" should be collected for search dogs. Take a plastic bag and invert it over your hand. Using the bag like a glove, pick up articles such as socks, underwear, hats - then invert the bag over the items, so your hand never comes in contact with the articles,
- Leave notes at trailheads or other exit points telling the lost party what to do if they get there.

"So, What are we looking for, anyway?"

The truth is that professional searchers are looking more for clues than for victims. There are always more clues than victims, and once clues are found, the size of the search area is significantly reduced. To make the job of searchers easier, lost parties can leave clues such as clear footprints, arrows drawn with sticks, notes attached to trees or anything they can think of to signal rescuers. Searchers should be taught to search for clues and hope they trip over the victim in the process.

Rescue Response

Rescues require specific skills without which a bad situation can become worse. There are a number of elements related to rescues that outdoor educators should consider when undertaking rescue operations.

Level of Emergency

First and foremost, is the need to evaluate the level of the emergency. What is the nature of the injuries? If life threatening, what is the level of medical care available?

Take a moment to carefully evaluate the situation. Is a helicopter proposed for the rescue? If so, is it necessary? Has the rescue leader truly considered the danger of airborne rescue operations? Many rescue accidents occur because of haste in the rescue effort.

A common belief among backcountry rescue professionals is that the subject is usually stable - dead or alive. Still, in the case of experiential programs, potential rescuers are often at the scene immediately, not a 9-1-1 call away. For this reason, acting with great urgency is important.

Type of Emergency

Before you can determine the appropriate rescue response, you have to look at the type of emergency. The evacuation options are dependent on the nature of the terrain, injuries, weather, and the equipment and supplies available.

If the subject is ambulatory or semi-ambulatory, evacuation might be as simple as a horseback ride or even an assisted walkout. But in the more difficult situations, evacuation might only be possible by use of a rescue litter. And if the terrain is real nasty, a technical rescue system may be required to lower the litter to more benign terrain.

Technical Rescue Systems

Any experiential program that participates in activities in mountainous terrain may encounter emergencies that require a technical evacuation of a stranded or injured climber. This means lowering a litter with one or more litter-bearers to the patient, loading the patient carefully, and continuing the lowering to the ground.

Rescuers must understand and have experience with technical rescue anchors and systems, since they are vastly different than climbing anchors and systems. Obviously all participants must understand the physical components of any rescue system to be used. Familiarity with equipment and technique is essential, as is an understanding of the appropriateness of the equipment to be used. Actual rescue operations should not be the time for participants to learn rescue equipment and techniques.

The term "technical rescue" means more than rescues that take place in technical terrain. Technical rescue systems are often necessary on relatively easy 5th-class terrain, simply because the subject is not ambulatory and needs to be transported by a litter with numerous attendants.

While vertical rescue operations are exhausting to the litter attendants, low- to moderate-angle technical rescues can be more exhausting. In the vertical situation, the subject, rescuers, and equipment are generally fully weighted on the anchors above. In the low- to moderate-angle evacuation, this weight is often transferred to the arms and legs of litter attendants. In this situation, rescuers must have the upper- and lower-body strength to sustain long evacuations. Rescuers with experience are often prepared for the physical requirements of such operations - adrenaline-laden novices, on the other hand, may be unprepared.

Do You REALLY want to do this?

"While a climbing anchor needs to support a falling climber, a rescue anchor needs to support a falling School Bus "

Charley Shimanski - Mountain Rescue Association

While most climbers understand the theory of "shock-loading" systems, they understand it only as regards the weight of a single climber. Technical rescue loads involve forces well beyond those encountered in climbing. Rescue loads are magnitudes greater as forces increase with the weight of the victim, any attending rescuers, and the rescue system itself. Shock-loading such systems can be disastrous.

The appendix in the back of this manual references texts that teach technical rescue operations. In particular, the American Mountain Guides Association has prepared basic training for one-on-one rescue of stranded or injured climbers.

Trail Carry

The more frequent rescue will be a simple trail carry of an injured subject in a litter. A trail carry usually involves 4 to 6 litter-bearers that walk on each side of the litter and carry it down an established trail.

Although it sounds simple, a trail carry can be a challenge because most trails are not wide enough for three people to walk side by side - yet a litter and attendants are as wide as 3 people.

Some simple precautions for a trail carry include:

- Pad the litter before putting the patient in. This should include a pad underneath the knees.
- Eye and head protection must be provided to the patient,
- Secure the patient inside the litter using tie-downs so that difficult terrain can be negotiated without separating the patient and litter.
- Litter bearers should monitor the subject constantly (nausea and vomiting are not uncommon, since the patient is tied down flat on his/her back and suffering through what can be a bumpy ride),

If you have more than enough litter-bearers for the trail carry, you can help them work in periodic breaks without stopping the litter. This is accomplished as follows:

- As the litter is carried down the trail, a replacement pair of litter-bearers approaches the litter from the rear,
- The replacements grab the litter firmly, then tap the shoulder of the litter bearer in front of them indicating they can take the load,
- That litter-bearer moves forward one position, then taps the shoulder of the bearer in front of him/her,
- When the front litter-bearers are tapped, they leave the litter and advance down the trail to the location where they can then prepare to become the next replacement group.

Using YOUR OWN Resources for the Rescue

Certainly any small adventure program can carry out a successful rescue by improvising with its own existing equipment. A slipknot rope litter, and a litter fashioned from skis and poles are effective and easy-to-assemble litters.

Wisely, some adventure programs include into their coursework the building and use of these types of litters, giving the participants a valuable lesson in the importance of emergency preparedness in any adventure.

With no more than slight modifications to your equipment list, you may be able to include the equipment required to fashion a homemade litter. Still, keep in mind that while a homemade litter might be ideal for trail carries of non-ambulatory patients, only hard litters (such as a Stokes Litter) should be used for technical evacuations or for the seriously injured. No patient with suspected spinal injury should travel in an improvised litter.

What to do with Your Resources

Whenever possible, get your students involved in the rescue. They can assist by:

- Creating shelter, if necessary, for the subject and/or rescuers,
- Caring for and monitoring the patient, including medical condition, etc.,
- Providing food and drink for the program participants,
- Providing emotional support to the subject and the other participants.

Use of Helicopters in Field Rescue Operations

Med-Evac Helicopters are a valuable resource that outdoor programs can call upon to assist in evacuation. Some hospitals with helicopter capability may choose to fly by virtue of little more than the description by a qualified professional in the field.

As such, outdoor program managers must assure their program considers the following issues:

- Know the resources available and how to request them by phone and/or radio,
- Know their flight times to your locations,
- The actual communication with the hospital should be made from the field when possible. Field personnel can better describe the nature of injury, weather conditions, and proposed landing zone,
- The local law enforcement agency should be contacted immediately in the event of any helicopter med-evac (In mountains, a 9-1-1 call will often NOT give you the local agency),
- Field staff must have the authority to call for a helicopter if other levels of authority cannot be reached,
- A pre-plan should include helicopter protocol and all staff should be trained in basic helicopter safety.

Working with Local Search and Rescue Teams

In the United States, search and rescue generally falls under the jurisdiction of the county sheriff or state police. In highly populated backcountry areas, that law enforcement authority will generally have an organized volunteer search and rescue group. In those areas where there are many SAR missions each year, the local team is usually a group accredited by the Mountain Rescue Association. This means they have been tested by their peers at least every five years in four key disciplines:

1. Technical rescue
2. Search
3. Avalanche rescue
4. Winter rescue

While not every SAR team in the U.S. is an MRA-accredited team, many are. For those that are not MRA-accredited, the organized rescue team may be comprised of individuals whose experience level ranges from beginner to advanced.

Depending on the locality, the local sheriff may either turn the leadership of the SAR response over to the organized SAR team entirely, or the sheriff may take a greater role in the operation. This is usually at the discretion of the sheriff.

Conclusion

While outdoor adventure programs continue to develop and refine their Emergency Response Plans, it is becoming equally important that programs in search, rescue and emergency management be developed. Hopefully this training has helped identify some of the elements that are essential to developing such a program.

Suggested Readings

Wilderness Search and Rescue

Tim J. Setnicka; © 1980, The Appalachian Mountain Club; Boston, MA

Managing the Lost Person Incident

Kenneth Hill, Editor; © 1997, National Association for Search and Rescue

Technical Handbook for Professional Mountain Guides

@1999 Association of Canadian Mountain Guides, American Mountain Guides Association

Emergency Response Systems for Outdoor Programming

Jay Satz; © 1999, The Wilderness Risk Managers Committee and the author; 1999 Wilderness Risk Management Conference Proceedings

High Angle Rescue Techniques

Tom Vines and Steve Hudson

© 1999 Mosby, Inc.

11830 Westwood Industrial Drive

St. Louis, MO 63146

Managing Field Evacuations

Jay Satz, David McEvoy, Kurt Merrill; © 1999, The Wilderness Risk Managers Committee and the authors; 1999 Wilderness Risk Management Conference Proceedings

Stress and the Rescuer

Tod Schimelpfenig & Linda Lindsey; © 1998, The Wilderness Risk Managers Committee and the authors; 1998 Wilderness Risk Management Conference Proceedings

Helicopters in Search and Rescue Operations - Basic and Intermediate Levels

© 2002 Charley Shimanski/Mountain Rescue Association; Golden CO 80401

Avalanche Rescue Operations

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Mountain Travel and Rescue

© 1995, National Ski Patrol System; Lakewood, CO 80228