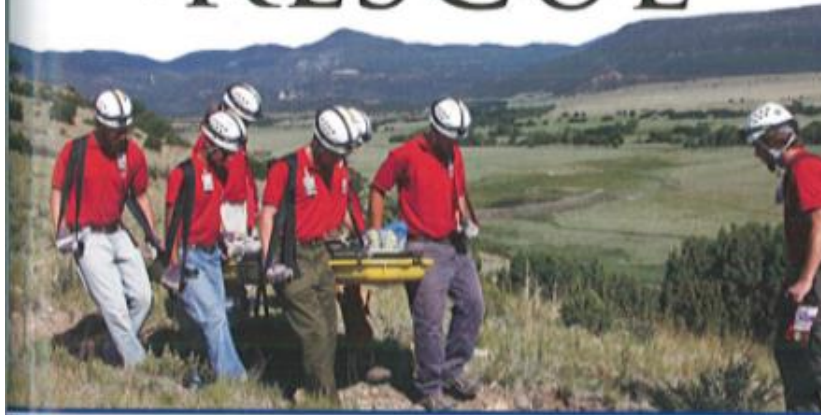


MERIT BADGE SERIES



SEARCH AND RESCUE



BOY SCOUTS OF AMERICA

Requirements

1. Do the following:
 - a. Explain to your counselor the hazards you are most likely to encounter while participating in search and rescue (SAR) activities, and what you should do to anticipate, help prevent, mitigate, and respond to these hazards.
 - b. Discuss first aid and prevention for the types of injuries or illnesses that could occur while participating in SAR activities, including: snakebites, dehydration, shock, environmental emergencies such as hypothermia or heatstroke, blisters, and ankle and knee sprains.
2. Demonstrate knowledge to stay found and prevent yourself from becoming the subject of a SAR mission.
 - a. How does the buddy system help in staying found and safe?
 - b. How can knowledge of the area and its seasonal weather changes affect your plans?
 - c. Explain how the Ten Essentials are similar to a "ready pack."
3. Discuss the following with your counselor:
 - a. The difference between *search* and *rescue*
 - b. The difference between *PLS* (*place last seen*) and *LKP* (*last known point*)
 - c. The meaning of these terms:
 - (1) AFRCC (Air Force Rescue Coordination Center)
 - (2) IAP (Incident Action Plan)
 - (3) ICS (Incident Command System)
 - (4) Evaluating search urgency
 - (5) Establishing confinement
 - (6) Scent item
 - (7) Area air scent dog
 - (8) Briefing and debriefing
4. Find out who in your area has authority for search and rescue and what their responsibilities are. Discuss this with your counselor, and explain the official duties of a search and rescue team.
5. Complete the training for ICS-100, Introduction to Incident Command System. Print out the certificate of completion and show it to your counselor. Discuss with your counselor how the ICS compares with Scouting's patrol method.
6. Identify four types of search and rescue teams and discuss their use or role with your counselor. Then do the following:
 - a. Interview a member of one of the teams you have identified above, and learn how this team contributes to a search and rescue operation. Discuss what you learned with your counselor.
 - b. Describe the process and safety methods of working around at least two of the specialized SAR teams you identified above.
 - c. Explain the differences between wilderness, urban, and water SARs.
7. Discuss the Universal Transverse Mercator (UTM) system, latitude, and longitude. Then do the following:
 - a. Using a 1:24,000 scale USGS topographic map, show that you can identify a location of your choice using UTM coordinates.
 - b. Using a 1:24,000 scale map, ask your counselor to give you a UTM coordinate on the map, then identify that location.

To complete requirement 5, you will need to go online (with your parent's permission). See the resources section for more information.

A Note About Unauthorized and Restricted Activities

The BSA's *Guide to Safe Scouting* states under "Unauthorized and Restricted Activities" that flying in aircraft as part of a search and rescue mission is an unauthorized activity for youth members. For complete information, see <http://www.scouting.org/scoutsource/HealthandSafety.aspx>.

- c. Show that you can identify your current location using the UTM coordinates on a Global Positioning System (GPS) unit and verify it on a 1:24,000 scale map.
 - d. Determine a hypothetical place last seen, and point out an area on your map that could be used for containment using natural or human-made boundaries.
8. Choose a hypothetical scenario, either one presented in this merit badge pamphlet or one created by your counselor. Then do the following:
- a. Complete an incident objectives form for this scenario.
 - b. Complete an Incident Action Plan (IAP) to address this scenario.
 - c. Discuss with your counselor the behavior of a lost person and how that would impact your incident action plan (for example, the differences between searching for a young child versus a teen).
 - d. After completing 8a-8c, discuss the hypothetical scenario with your counselor.
9. Discuss with your counselor the terms *hasty team* and *hasty search*. Then do the following:
- a. Plan and carry out a practice hasty search—either urban or wilderness—for your patrol or troop. Include the following elements in the search: clue awareness, evidence preservation, tracking the subject, and locating the subject using attraction or trail sweep.
 - a. When it's over, hold a team debriefing to discuss the hasty search. Discuss problems encountered, successful and unsuccessful tactics, and ideas for improvement.
10. Find out about three career or volunteer opportunities in search and rescue. Pick one and find out the education, training, and experience required for this professional or volunteer position. Discuss this with your counselor, and explain why this position might interest you.

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What Is Search and Rescue?

Imagine the concern a parent or loved one has when a teenager is overdue from a hike in the wilderness, a small child is missing from a crowded playground, a rock climber becomes stranded on a precarious ledge, or an elderly person wanders away from a caregiver. These occurrences happen several hundred times each year and often may require the services of trained search and rescue (SAR) managers and teams.

While many people are able to self-evacuate from remote areas thanks to advances in technology such as cell phones, GPS (Global Positioning System) receivers, and personal locator devices, people still get injured and lost.

Be aware that earning the Search and Rescue merit badge will not qualify you as a trained searcher. You should never attempt a search or rescue on your own.

If you find yourself confronted with a missing person situation, remain calm and immediately report the situation to a Scout leader, parent, or responsible adult. If these people are not immediately available, promptly call 911 and report the missing person emergency to the authorities.



A search and rescue mission is much like solving a classic mystery. Once a person (called the *subject*) is reported missing, law enforcement officials activate search teams. The following procedure then takes place:

1. An incident commander is appointed to run the search and rescue operation using what is called the **Incident Command System (ICS)**.
2. An Incident Action Plan (IAP) is developed to guide the searchers as they look for the subject.
3. The incident commander and his or her staff decide which kind of teams to deploy. These could be ground, horse, dog, ATV, snowmobile, mountain bike, or even aircraft teams.
4. Teams are deployed to search for the subject using a variety of search and rescue skills.
5. If all goes well, the subject is located and returned to safety.

As you read this pamphlet and work on this merit badge, you will learn and practice many skills that may someday help save a life!

What Is a Search? What Is a Rescue?

A *search* is an emergency situation requiring a team of trained searchers to locate a missing person. The search may be brief and simple, such as finding a missing child who is sleeping in his parents' car, or it may involve hundreds of searchers and days of coordinated, well-managed activity.

A *rescue* is an emergency situation where a person's location is known—perhaps having just been found by searchers—and he or she must be removed from danger and returned to safety. This may involve simply walking the person along a trail or it may require technical rescue skills and medical care.

The term *search and rescue* (SAR) is used because rescues are often required after the person is found. Frequently the same people are trained to do both functions—search for the subject and then treat and remove the subject.



Who Does Search and Rescue?

When a friend, fellow Scout, child, family member, or community member is missing, we expect that there will be well-trained, caring people who will search for, possibly rescue, and bring that person to safety.

Members of search and rescue teams are nearly all volunteers, although some may be Forest Service, Coast Guard, or fire and rescue workers, or members of other agencies. Staff members at Scouting high-adventure bases, including Philmont Scout Ranch, are also trained in SAR.

There are a number of organizations that play a major role in search and rescue efforts in the United States and some foreign countries. The Air Force Rescue Coordination Center serves as the single agency responsible for coordinating land-based federal SAR activities in the 48 contiguous states. It also provides assistance in Mexico and Canada.

Search and rescue is one of the United States Coast Guard's oldest missions. Coast Guard SAR response involves multimission stations, cutters, aircraft, and boats linked by communications networks. The Coast Guard is the maritime SAR coordinator and is recognized worldwide as a leader in the field of search and rescue.

The U.S. Forest Service, national and state parks, Homeland Security and its Bureau of Customs and Border Protection, State Department, Federal Emergency Management Agency (FEMA), National Transportation Safety Board (NTSB), Federal Communications Commission (FCC), Civil Air Patrol (CAP), and many other agencies are involved in search and rescue. There is even a national SAR plan available online. Check the resources section for links to agency websites.



The National Association for Search and Rescue (NASAR) is a nonprofit organization that promotes development and improved coordination among all SAR resources. NASAR offers training and certification functions to help teams worldwide be better prepared to do SAR.

How to Contact a SAR Team

A computer search or a phone call to your local police, sheriff, or state police office will help you determine the best SAR team to interview.

The governors of each state decide which state or local agency has responsibility for search and rescue activities within their borders. The Mountain Rescue Association (MRA), National Ski Patrol, dive teams, cave rescue groups, and four-wheel drive clubs all stand ready to assist with SAR as well.

Here are a few sample questions:

- Who is in charge of the SAR team mission?
- How long does it take to train a search dog?
- What is the best kind of dog for SAR?
- What kind of technology is involved in SAR?
- How old do you have to be to be on a team?
- How often does the team go on a SAR mission?



Trained search and rescue officials have skills and training that help them determine the best strategy for finding lost people.



The World of SAR

Search and rescue, much like Scouting, has its own unique language. In order to understand search and rescue, it is necessary to know some of the most common terminology and how SAR operations are structured.

Incident Command System

The **Incident Command System (ICS)** is a systematic approach to the management of emergency incidents. Used by fire departments, emergency medical services, law enforcement agencies, and search and rescue teams to manage all types of emergencies, this system is flexible and scalable to all types and sizes of incidents and events. ICS is the most effective, efficient, and economical system to manage search and rescue incidents.

History

Wildland firefighters first used the ICS in the 1970s for the management of large wildland fires. In the 1980s, the National Fire Protection Association began requiring that the ICS be used to manage all large fire and emergency medical incidents. In 2003, Homeland Security Presidential Directive 5 (HSPD-5) mandated that all federal agencies use ICS to manage all incidents.





FEMA

FEMA offers a series of courses for those involved in emergency planning and response activities. Introduction to the Incident Command System, or ICS 100, is a foundational course that provides instruction on the history, organizational structure, and principles of ICS. This course serves as the basis for more advanced courses in emergency management.

Key Concepts

The Incident Command System uses five key concepts.

Unity of Command. Unity of command refers to the concept that each person or resource responding to a scene reports to only one supervisor. This eliminates the potential for individuals to receive conflicting orders from multiple supervisors. Unity of command increases accountability, prevents resources from working without the knowledge of command, improves the flow of information, and enhances operational safety. This concept is fundamental to the ICS chain of command structure.

Common Terminology. In the past, individual agencies or teams developed their own terminology. This often led to confusion when groups worked together, as some words or codes had different meanings for each group. The ICS requires that all agencies responding to an incident use common terminology and clear language during radio communications. This means, for example, responding "Affirmative" rather than "10-4" to indicate understanding. ICS has an associated glossary of terms to bring consistency to position titles, resource descriptions, and organizational structure.

Management by Objective. Incidents are managed by setting and working toward specific objectives. Objectives should be ranked by priority, as specific as possible, attainable, and if possible given a working time frame. Objectives are accomplished by first outlining strategies (general plans of action), then determining appropriate tactics (how the strategy will be executed) for the chosen strategy.

Flexible and Modular Organization. ICS is organized so that it can grow or shrink as the incident dictates. Command is established from the top down, with the most important positions, such as incident commander, established first. Only those positions that are required need to be filled. Most incidents will require that only a few positions be filled. However, as the incident grows and more resources are required, more positions may need to be added.

Span of Control. The concept of manageable span of control limits the number of resources and responsibilities that are managed by a single supervisor. The ICS requires that any single person's span of control should be from three to seven individuals, with an optimal number of five but no more than seven. If more than seven resources are being managed by an individual, the command structure needs to be expanded by adding new command positions.

Good management in search and rescue requires capable people knowing what to do at all levels, each with a clear picture of the incident command structure. This is why everyone involved in a search and rescue operation must have basic knowledge of the Incident Command System. Everyone must know his or her position within the overall structure and must understand the terms and functional titles used. After all, what good does it do to call a person an incident commander if no one really knows what that means?

Only in very large and complex incidents would all the ICS positions be staffed. As the incident scales down, the ICS positions will be eliminated until there is only an incident commander.

Incident Command Positions

The ICS is organized by levels, with the supervisor of each level holding a specific title.

Incident Commander. The incident commander (IC) provides overall leadership for the incident response and delegates authority to others in his or her command. The incident commander performs all command responsibilities until he or she assigns people to those positions, establishes the incident objectives, and directs the development of the Incident Action Plan (IAP), a set of documents that call for details about the search and rescue. The incident commander typically has training and certification, as well as experience in multiple positions within the ICS.

There are three types of incident command.

- **Single incident command**—This is the most common type of incident command. A single individual is designated as the incident commander and has the sole responsibility for the incident.
- **Unified command**—A unified command is often used for larger incidents when multiple agencies are involved. A unified command usually has one representative from each agency involved; these representatives act together as a single entity for the command.
- **Area command**—During multiple-incident situations, such as a large wildland fire or natural disaster, an area command may be established. The area commanders provide for incident command at separate locations. In this case, they typically manage resources and do not establish objectives or develop IAPs (Incident Action Plans).

A *briefing* is a meeting in which information is provided on what to do (the task at hand) or what to expect ahead of time. A briefing can include all known information about the subject of a search. A *debriefing* is a meeting in which the search team is questioned about its success or problems or difficulties encountered during the search.

COMMAND STAFF

An Incident Command System enables integrated communication and planning by establishing a manageable span of control. An ICS divides an emergency response into five manageable functions essential for emergency response operations: Command, Operations, Planning, Logistics, and Finance and Administration. This chart shows a typical ICS structure.



The command staff consists of the safety officer, public information officer, and liaison officer. These officers report directly to the incident commander and may have assistants in major incidents.

Safety officer—The safety officer monitors the safety of all responders and bystanders and gives safety messages at planning meetings and briefings.

Public information officer—The public information officer (PIO) provides information to the public including media and government officials.

Liaison officer—A liaison serves as the primary contact for supporting agencies involved in the incident.

GENERAL STAFF

The general staff is made up of the operations, planning, logistics, and finance/administration section chiefs.

Operations section chief—The operations section chief is tasked with determining tactics and supervising resources to meet the incident objectives.

Planning section chief—The planning section chief is responsible for collecting, evaluating, and disseminating incident information; developing and documenting the IAP (Incident Action Plan); and leading the planning meeting.

The planning meeting's main purpose is to develop the Incident Action Plan for the next operational period. Most planning meetings last less than 30 minutes.



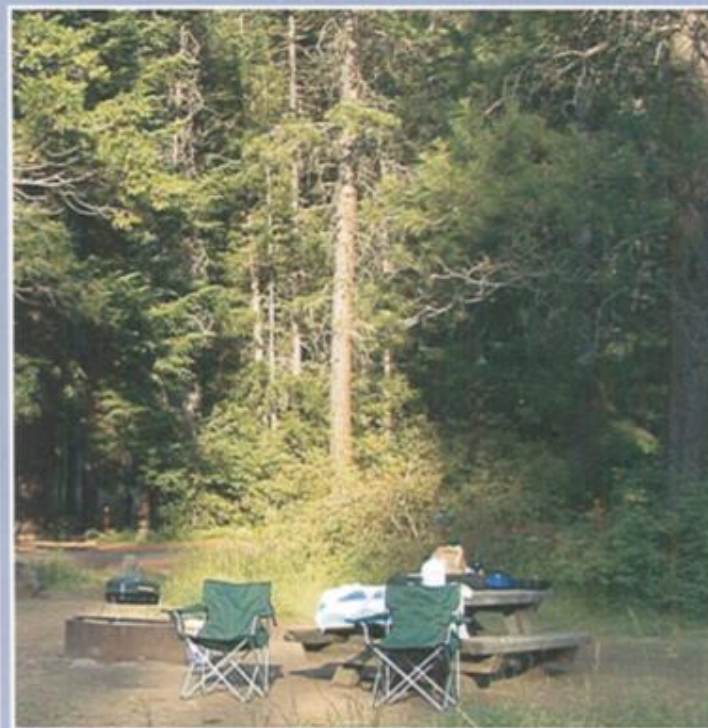
Logistics section chief—The logistics section chief provides facilities, services, and material support for the incident.

Finance/Administration section chief—The finance/administration section chief is tasked with all administrative and financial considerations surrounding an incident. This is the least used section.

Place Last Seen/Last Known Point (PLS/LKP)

While these terms are similar, they have slightly different meanings.

The PLS is where someone who can positively identify the subject actually saw the subject. The LKP could be the same as the PLS, but it may also be where the subject was known to have been but not necessarily seen. The suspect's abandoned vehicle, a log book at a trailhead, a photo taken at an ATM machine or by a security camera, or some other form of positive physical evidence can help establish the LKP.





Incident Action Plan and Mission Objectives

Now that you understand that the Incident Command System is used in both small and large emergencies, it is necessary to know why careful planning is done at the very beginning of the mission.

Even as the (IAP) Incident Action Plan is being developed, it is vital to confirm the confinement or search area and deploy some quick responses, such as a hasty team.

Search and Rescue Objectives

Search and rescue incidents are usually managed using the Incident Command System. This system uses a technique called "management by objectives," which involves determining your next action by developing objectives that must be obtainable, measurable, and flexible. An example objective might be "search for the missing subject from trailhead to top of ridge." Would this objective be obtainable, measurable, and flexible?

Notice that no search resources were part of the objective, as you might use more than one search resource to complete this objective, i.e., a ground team and a helicopter. The kinds of resources used are very rarely identified as part of an objective.

A hasty team is the first team deployed during a search. Its job is to look quickly and accurately for clues that may lead team members to the subject. This quick search is called a hasty search.

A good way to look at an *objective* is to ask “what do you want done?” *Strategies* answer the question “how do you want it done?” *Task assignments* answer “who do you want to do it?”

Search resources are used to meet the objectives. There may be many objectives during a search or rescue incident. However, even in major disasters there are usually fewer than 10 objectives at any particular time.

Objectives are developed for a specific time period, called the *operational period*. Most operational periods are 12 hours long, though they can be any length that the incident commander orders. For instance, in the above scenario one objective could be “check all campgrounds within three miles of the hunting camp every three hours until subject is located or search incident is suspended.” This objective covers multiple time periods and would be an incident-long objective.

The Incident Action Plan

Now that you know what the objectives and operational time periods are, you can add other tasks and information needed to manage the next operational period. This plan is referred to as the Incident Action Plan (IAP).

Incident Action Plan

The IAP consists of eight forms (available at http://www.fema.gov/pdf/emergency/nims/ics_forms_2010.pdf):

- Incident Objectives (ICS 202) [[12A]]
- Organization Assignment List (ICS 203) [[12B]]
- Assignment List (ICS 204) [[12C]]
- Incident Radio Communications Plan (ICS 205) [[12D]]
- Communications List (ICS 205A) [[12E]]
- Medical Plan (ICS 206) [[12F]]
- Incident Organization Chart (ICS 207) [[12G]]
- Safety Message/Plan (ICS 208) [[12H]]

The image displays four ICS forms used in incident management:

- INCIDENT OBJECTIVES (ICS 202):** A form for defining specific goals and strategies for an incident. It includes sections for incident name, location, and a list of objectives with associated strategies and task assignments.
- ORGANIZATION ASSIGNMENT LIST (ICS 203):** A form for assigning personnel to various organizational positions. It lists positions such as Incident Commander, Operations, Logistics, and Finance, and assigns individuals to these roles.
- ASSIGNMENT LIST (ICS 204):** A form for detailing specific tasks and assignments for personnel. It includes columns for assignment number, description, priority, and assigned personnel.
- INCIDENT RADIO COMMUNICATIONS PLAN (ICS 205):** A form for planning radio communications. It includes a grid for listing radio channels, frequencies, and call signs, along with sections for incident name, location, and communication procedures.

The image displays four forms used in an Incident Action Plan (IAP):

- COMMUNICATIONS LIST (ICS 204):** A table for listing communication methods, including radio frequencies, phone numbers, and other contact information.
- MEDICAL PLAN (ICS 205):** A form for detailing medical resources, including personnel, equipment, and procedures.
- INCIDENT ORGANIZATION CHART (ICS 207):** A hierarchical organizational chart showing the structure of the incident response, from the Incident Commander down to various functional areas.
- SAFETY MESSAGE PLAN (ICS 208):** A form for planning safety messages, including the content of the messages and the personnel responsible for delivering them.

Some parts of the IAP might not be needed. For example, a traffic plan would only be used if you needed to reroute vehicle traffic to avoid congestion at the SAR incident base.

The IAP may also include an incident map, traffic plan, and subject information. Other pieces of information that might be important to document the next operational time period can also be included.

The ICS planning section is responsible for putting this plan together. When completed, the plan is presented at a command and general staff meeting, called the *planning meeting*. This meeting is normally held during the middle of the current operational time period. The purpose of this meeting is to review the current period objectives and put together a plan of action for the next operational period. The meeting has an agenda and is chaired by the planning section chief.

All elements of the IAP are discussed and modified as needed. The incident commander must approve the plan before it can be implemented. The key is finding information that could be used to help develop the IAP and completing the relevant forms. You might not have enough information to fill out any one form completely, while some information should be duplicated on every form, i.e., name of the SAR incident, next operational time period, date, and time.

A Note About Practice Scenarios

To fulfill requirement 8, you may use any of the practice scenarios presented in this pamphlet. If you prefer, your merit badge counselor might also create one for you. Search and rescue, like any other skill, is best learned by practice. For this merit badge, you will not have a real subject to search for; therefore you and your patrol or troop should test the skills you have learned by doing practice search activities.

Practice Scenario 1

It is noon. You are assigned to the planning section and are asked to prepare for the planning meeting to be held at 2 p.m. The information available so far is the following: A Scout from Troop 1792 is missing. John Lopez, age 14, was last seen yesterday about noon when his patrol stopped for lunch on the Bear Canyon trail at Philmont. He was not feeling well and thought he had eaten something that upset his stomach. He has a history of stomach trouble and has medication that controls it; however, he did not bring it with him yesterday. When found, he may need medical attention. The closest ambulance is located in Cimarron and can be contacted at 575-123-4568 if needed.

For this practice scenario, you might use the following.

Objective: Search from campground road to Silver Lake

Strategy: Use a K9 dog team and aircraft

Task Assignment: K9 team 4, Civil Air Patrol (CAP) aircraft

The Scoutmaster, who is a trained incident commander (IC), has named the search the "Bear Canyon Search" and as IC has put together the following objectives for today's search actions.

1. Ensure the safety of all Scouts on the search incident.
2. Search Bear Canyon trail from the place last seen (PLS) to the old log cabin.
3. Notify all campers at campgrounds within three miles of the PLS of the missing Scout.
4. Ensure good radio communications cover the entire search area.

The IC, Bill Johnson, said he would stay on as the incident commander during the next operational period. Rhonda Jackson is operations section chief, Ben Sakamoto is planning section chief, Charlene Greer will stay with the family as liaison officer, and Bob Real is the logistics chief.

The operations section chief has requested that all searchers in the field use the local sheriff's radios on channel 4. Logistics has requested its section use channel 2. The sheriff's department has advised the IC that their radio network will cover the entire search area.

It has been reported that bears may be in the search area. All searchers should be notified to be alert for signs of bears. Weather in the search area tonight should be very cold. Temperatures may drop to 25 degrees, and winds are predicted to be from the north at 15 mph with gusts to 25 mph until about dawn.

The planning section is preparing posters advising all participants of the possibility of bears in the search area, as well as the predicted cold weather.

The operations section chief has requested that K9 team 4 search the Bear Canyon trail tonight. She will advise the team to be aware of any signs of bears. The K9 team will need transportation from the log cabin back to the incident base. She has also requested that one of the sheriff's vehicles check all campgrounds within three miles of the PLS every four hours tonight, as well as interview all campers about the missing Scout and tell them to call 911 if they see him.





Special SAR Environments

When many people think about search and rescue missions, they typically think of operations occurring in wilderness areas, such as canyons, forests, and other remote locations. SAR operations, however, can take place in any environment where people are missing.

Urban SAR

An urban search involves looking for a subject in a populated area as opposed to a wilderness setting. In addition to basic SAR principles, searchers working in an urban environment must also know how to use equipment suited to the situation, be aware of safety concerns relating to traffic and other hazards, and understand subject behavior as it applies to an urban environment.

The subject of an urban search is often a small child or an elderly person. Someone's toddler or an Alzheimer's patient may have wandered away and be lost and confused. The care and skill of urban search teams may turn a possible tragedy into a happy reunion.

Type 1 Urban Search

Urban SAR teams work in cities, suburbs, and even rural areas. The type 1 urban search is like a hasty search but emphasizes notification of nearby residents and quick searches of areas open to the public.

At times a search may originate in an urban area and quickly move to a less populated neighborhood or even the wilderness. An example of this might be if the last known point (LKP) is near the edge of town.

The teams must always understand that the search may be related to a crime against the subject such as abduction.

Searches in urban areas are most effective when conducted at times when residents are at home and can be alerted. Often neighbors have information about the subject that can be useful.

Being able to hand out fliers and photos of the subject and interview neighbors will create a sense of urgency and may result in a quick find of the subject. Search team leaders might identify themselves as follows:

"Hello. My name is _____. I am with (name of search organization). We are looking for (subject's name). Can you help us?"

When searching a neighborhood, search team members ask residents if they or any members of their family have seen or know the subject. They are requested to search their own yards and outbuildings or other places where a subject may seek shelter on their property.

Searchers also ask about any known trails or possible places in the area where the subject could seek shelter. (Children sometimes know more about trails than adults.) Parks, beaches, school yards, urban trails, trash bins, and open public buildings should be quickly searched.

The team scribe or note taker will record information about who has been contacted and their address, the public areas that have been checked, and where additional SAR efforts are needed. If the searchers find the person or something that might help in the search, they should log the information and then communicate via phone or radio with the SAR team base.

Any areas that present a safety concern or are occupied by a suspicious person must be searched by law enforcement personnel. The well-being of team members must always be considered.

Should these search tactics not be successful, a type 2 search is warranted.

Type 2 Urban Search

The type 2 urban search is a systematic search of yards and buildings and all places within the assigned area. The interview and introduction are as in a type 1 search except that the team members will seek permission to do the search themselves. If a residence is the LKP, it must be searched by highly trained searchers. The landowner or a representative should be present if at all possible. This type of SAR is generally used within one-quarter mile of the PLS or LKP.



Type 3 Urban Search

Although seldom used, a type 3 search may be necessary in instances where a very thorough search is needed to cover an area. This is very similar to how and when SAR would be conducted in a wilderness setting.

As this search becomes more complicated, be aware that the incident may be leaning toward the commission of a crime. Additional personnel who have advanced skills and a positive mental attitude, are very clue aware, and are able to fully document their actions in writing will be used.

Areas that are woody, brushy, or have high grass may have to be grid searched utilizing wilderness tactics.



Water Rescue

On an average day, the U.S. Coast Guard responds to 64 SAR cases and assists 117 people in distress.

Search and rescue is one of the Coast Guard's oldest missions. Preventing and minimizing the loss of life, injury, or property damage or loss by rendering aid to people in distress in a maritime environment has always been a Coast Guard priority. The Coast Guard monitors distress (mayday) signals and responds on the waters of the Atlantic and Pacific oceans, the Gulf of Mexico, and several inland waterways.

The Coast Guard responds to a SAR situation using cutters, small patrol boats, motor surf boats, and aircraft (both fixed wing and helicopters), all linked by a very high-tech communications network. The Coast Guard also provides maritime safety programs, including recreational boating safety and commercial vessel safety.

All families should have a list of emergency numbers posted near their phone. If you live near a large body of water, you should include the phone number of the nearest U.S. Coast Guard Rescue Coordination Center.

Reporting an Emergency to the Coast Guard

By Telephone	Look in the front of your telephone directory for an emergency number listing for the U.S. Coast Guard. or Dial 911. or Call the nearest U.S. Coast Guard Rescue Coordination Center listed in the front of most telephone directories.
By VHF-FM Radio (This is the preferred method for reporting emergencies from vessels on the water.)	Follow this procedure to call the Coast Guard: 1. Make sure the radio is on. 2. Select channel 16 VHF-FM (156.8 MHz). 3. Press and hold the transmit button. 4. Clearly say, "Mayday, mayday, mayday." 5. Give the name and description of the vessel, the position or location, the nature of the emergency, and the number of people on board. 6. Release the transmit button. 7. Wait for 10 seconds. Repeat the call until you receive a response.
By Cell Phone	Look in the front of your telephone directory for an emergency number listing for the U.S. Coast Guard. or Dial 911 Or Call the nearest U.S. Coast Guard Rescue Coordination Center listed in the front of most telephone directories.
By Email	If you are in distress or need to report an emergency, do not send a message via email or text messaging. Contact the Coast Guard via telephone or radio. You must have a two-way voice conversation.
By Other Methods	There are nationally and internationally accepted visual and sound distress signals (using flares, horns, mirrors, flashing lights, and flags).

Standard Marine Distress Signals



Unofficial but still widely recognized distress symbols include flying an inverted U.S. flag or waving a red-orange flag of any size.



Searching in Snow

When people become lost, the environment in which they find themselves is often a critical factor in their survival. The weather, along with poor decision-making, often causes problems for both the searchers and the subject. Some of the most demanding SAR environments are those in which snow is a factor.

Snow can be a challenging weather condition in which to perform search and rescue. However, one nice thing about snow is that often you can visually track a subject, although the tracks can be lost quickly due to wind and additional snowfall. Among the many considerations when preparing to search in snow are proper clothing, additional gear, terrain, and specialized teams and training.

As when dealing with any challenging search and rescue situations, be careful to keep yourself safe and know when to stop and ask for help before you are in over your level of training and experience. **Do not become an additional subject.**

When looking for someone who is lost or injured in a snowy environment, among the primary concerns are hypothermia and other cold- or exposure-related injuries. In such cases, you need to be almost as aware of your own health and that of the searchers around you as the subject's. Hydration is key, as well as fueling your hard-working body, so you need to make sure you have plenty of water and food and maybe even a stove and fuel to prepare some morale-lifting hot food and drinks.

Avalanche Rescue

Avalanches are one of nature's most powerful events and can cause a great deal of damage and loss of life. Avalanches occur when three variables combine—snowpack, terrain, and weather. Each of these aspects is important, but avalanches are not hazardous without the addition of property or people. Avalanche rescue is conducted only by trained and qualified personnel and never by Scouts.



Only trained personnel should participate in avalanche rescue. To find an organization in your state that provides such training, search on the Internet for your state's emergency management agencies.

Practice Scenario 2

You and your troop are camping out at Oak Flats campground for the weekend. It is a sunny spring Saturday and everyone in the troop has been busy working on skills and merit badge requirements. Suddenly, a woman looking distraught and worried approaches your group. She explains to your troop leader that her 4-year-old daughter, Annie, has disappeared from their picnic site just across the campground. She says that Annie was playing with the family's dog, and the next thing she knew, her daughter and the dog were gone. She is asking for help.

Annie is wearing a blue cotton top, red cotton shorts, and tennis shoes. She is in good health and has never wandered off before. The surrounding terrain has a lot of scrub oak trees and bushes, and it is hard for a short person to pick out landmarks. Your troop leader says he will call the Forest Service to alert them about the missing girl and request they start a search and rescue mission.

He instructs you, as the senior patrol leader, to have your patrols conduct a hasty search of the area, including checking all structures in the area. They should tell other campers they encounter about the missing girl and give them a description. If anyone finds her, they should come to your troop's campsite. He tells you to instruct the patrol search teams to use attraction to find Annie by calling out her name and the dog's name and then listening for an answer. He reminds you to be clue aware and to look for her tracks while searching.

Finally, he tells you to have all search teams return to the troop campsite in one hour to report their findings and be ready for a new assignment when the SAR coordinator arrives.



Be Prepared...Safety First

Before searchers go into the field, some thought must be given to their and their fellow team members' personal safety. It does the subject no good if the search is delayed because a team member gets injured.

The physical condition of the searchers and their equipment, and the suitability of their clothing must be checked by the safety officer or team leader. There will also be an environmental briefing describing possible hazards and weather conditions the searchers are likely to encounter.

Staying Found

For more than a century, Scouting has taught young people and adults the skills needed to safely enjoy the outdoors. Scouts who read the *Boy Scout Handbook* and *Fieldbook* and practice good hiking and camping principles will become proficient outdoorsmen. As you progress in the earning of this merit badge, you will learn more about skills that are important for search and rescue. Here are some pointers to keep from becoming the subject of a search and rescue.

- Always have a trip plan and share it with your parents.
- Stick to your trip plan.
- Know what the weather is like where you going and be aware of how quickly the weather can change.
- Never hike or camp alone; go with your patrol or troop.
- Use the buddy system.
- Have proper gear and clothing and take care of it.
- Log into trailhead log sheets if available.
- Get and stay in top physical condition; be prepared for the level of activity planned.

If your plans must change while on an outing, be sure to alert your parents. Call ahead to your destination if someone is expecting you.

And finally, discuss safety and good decision making with all the members of your patrol and troop. Get everyone's agreement to be safe and prepared.

Buddy System

The buddy system is a way for Scouts to look after one another, especially during outdoor adventures. You keep track of your buddy, and he keeps track of you. The buddy system should always be used when a troop or patrol is hiking, camping, and participating in any aquatic activities. The chances of a Scout becoming lost decrease when use of the buddy system is encouraged.

After you discover how search and rescue missions for lost people are reported in your area, discuss the procedure with your parents. Post the phone number of the local agency responsible for search and rescue along with other emergency telephone numbers.

In December 2011, members of PhilSAR (Philmont Search and Rescue) rescued a family whose vehicle had become disabled in a blizzard not far from the BSA high-adventure area. Their SUV was completely buried in the snow. The family had packed food and water for their trip and was able to survive for two days trapped in their vehicle. They called the state police on their cell phone and gave their approximate location. The PhilSAR team found the vehicle by using ski poles like avalanche probes and rescued the occupants as they were getting low on oxygen. This rescue had a happy ending because the family was prepared and did the right things to "stay found."

First Aid

Searchers should also be prepared to handle some typical first-aid situations that may arise, including snakebites, dehydration, shock, environmental emergencies such as hypothermia or heatstroke, blisters, and ankle and knee sprains.

Shock

The circulatory system of a person who is injured or under great stress might not provide enough blood and oxygen to the tissues of the body. This condition is called *shock*. Left untreated, it can be deadly (as organs can begin to fail). A shock victim can have some, all, or none of the following symptoms:

- Restlessness or irritability
- A feeling of weakness
- Confusion, fear, and dizziness
- Skin that is moist, clammy, cool, and pale
- A quick, weak pulse
- Shallow, rapid, and irregular breathing
- Nausea and vomiting
- Extreme thirst



Serious injuries and sudden illnesses are almost always accompanied by some degree of shock, but the victim might not be affected right away. Treat every accident victim for shock even if no symptoms appear. Prompt first aid may prevent shock from setting in.

1. Try to eliminate the causes of shock by restoring breathing and circulation, controlling bleeding, relieving severe pain, and treating wounds.
2. Summon emergency aid.
3. Monitor the victim closely to make sure the airway stays open for breathing.
4. If the victim is not already doing so, help him or her lie down. If you do not suspect back, neck, or head injuries, or fractures in the hip or leg, raise the feet about 12 inches to move blood from the legs to the vital organs.
5. Keep the victim warm with blankets, coats, or sleeping bags.



Blisters

A *hot spot*—the tender area as a blister starts to form—is a signal to stop immediately. To treat a hot spot or blister, cover the pinkish, tender area with a piece of moleskin or molefoam slightly larger than the hot spot. Use several layers if necessary.

If you must continue your activity even though you think a small blister will burst, you might want to drain the fluid. First, wash the skin with soap and water, then sterilize a pin in the flame of a match. Prick the blister near its lower edge and press out the fluid. Keep the wound clean and covered with a sterile bandage or gel pad and moleskin. Change bandages every day and treat the area to help keep wounds clean and avoid infection.

Sprains

A sprain occurs when an ankle, wrist, or other joint is bent or twisted far enough to overstretch the ligaments, the tough bands that hold joints together. Minor sprains cause only mild discomfort, but more serious sprains might be temporarily disabling. A sprained joint will be tender and painful when moved and might show swelling and discoloration.

Assume that any injury to a joint also may include a bone fracture. To treat sprains and prevent further injury, have the victim take any weight off of the injured joint and instruct him or her not to use the joint. Do not try to move or straighten an injured limb. Cover any open wounds with a sterile dressing. Apply ice packs or cold compresses to the affected area for no more than 20 minutes at a time. Be sure to place a barrier such as a thin towel between the ice pack and bare skin. Seek medical treatment if the pain is persistent or severe.

Hypothermia

A hypothermia victim may experience numbness, fatigue, irritability, slurred speech, uncontrollable shivering, poor judgment or decision making, and loss of consciousness. Treat a hypothermia victim by preventing the person from getting colder. After summoning help, use any or all of the following methods to help bring the body temperature back up to normal:

- If the person is fully conscious and able to swallow, have him or her drink warm liquids (soup, fruit juices, water; no caffeine or alcohol).

- Move the person into the shelter of a building or a tent. Remove wet clothing. Get him or her into dry, warm clothes or wrap the person in blankets, clothing, or anything handy that could be used, like jackets or a sleeping bag.
- Wrap towels around water bottles filled with warm fluid, then position the bottles in the armpit and groin areas.
- Monitor the person closely for any change in condition. Do not rewarm the person too quickly (for instance, by immersing the person in warm water); doing so can cause an irregular and dangerous heartbeat.

Dehydration

To treat mild dehydration, drink plenty of water or a sports drink to replace fluids and minerals. Drink one to two quarts (or liters) of liquids over two to four hours. See a physician for moderate dehydration. Severe dehydration requires emergency care; the victim will need intravenous fluids. Rest for at least 24 hours and continue drinking fluids. Avoid tiring physical activity. Although most people begin to feel better within a few hours, it takes about 36 hours to completely restore the fluids lost in dehydration.

Heatstroke

Left untreated, heat exhaustion can develop into heatstroke, which can lead to death if not treated immediately. In heatstroke, the body's cooling system begins to fail and the person's core temperature rises to life-threatening levels (above 105 degrees). One type of heatstroke develops in young, healthy people from dehydration and overexertion in hot weather, especially in high humidity. Signals of exercise-related heatstroke can include any signals of heat exhaustion as well as hot, sweaty, red skin; confusion; disorientation; and a rapid pulse.

The other type of heatstroke usually happens in elderly people when the weather is very hot, especially with high humidity. The signals are similar to exercise-related heatstroke except that the skin is hot and dry because there is no sweating.



Heatstroke is always a life-threatening condition. Call for medical assistance immediately. While waiting for medical personnel to arrive, work to lower the victim's temperature. Move the person to an air-conditioned or shady area. Loosen tight clothing and further cool the victim by fanning and applying wet towels. Wrap ice packs in a thin towel and place them under the armpits and against the neck and groin. If the person is able to drink, give small amounts of cool water.

Snakebites

The bite of a nonvenomous snake causes only minor puncture wounds and can be treated as such. Scrub the bite with soap and water, treat with an antiseptic, and cover with a sterile bandage. However, a venomous snakebite requires special care.

The venomous snakes of North America are pit vipers and coral snakes. Pit vipers, including rattlesnakes, copperheads, and cottonmouths, have triangular-shaped heads with pits on each side in front of their eyes. Signs of a pit viper bite include puncture marks, pain (perhaps extreme) and swelling (possibly severe), skin discoloration, nausea and vomiting, shallow breathing, blurred vision, and shock.

Coral snakes have black noses and are marked with side-by-side red and yellow bands, separated by bands of black. They inject a powerful venom that affects the victim's nervous system. Signs of a coral snakebite include slowed physical and mental reactions, sleepiness, nausea, shortness of breath, convulsions, shock, and coma.

The bite of a venomous snake can cause sharp, burning pain. The area around the bite might swell and become discolored; however, a venomous snake does not inject venom every time it bites. Here are the steps for treating the bite of venomous snakes.

1. Get medical attention for the victim as soon as possible so that physicians can neutralize the venom.
2. Remove rings and other jewelry that might cause problems if the area around the bite swells.

Because snakes are not warm-blooded, they cannot carry rabies.



3. If the victim must wait for medical attention to arrive, wash the wound. If it is a bite of a coral snake, wrap the area snugly (but comfortably) with an elastic roller bandage.
4. Have the victim lie down and position the bitten part lower than the rest of the body. Encourage him or her to stay calm.
5. Treat for shock.

Do not make any cuts on or apply suction to the bite, apply a tourniquet, or use electric shock such as from a car battery. These methods could cause more harm to the victim or are not proven to be effective.

Gear and Clothing

Search team members are called out on very short notice, so having a pack ready to go, called a *ready pack*, is important. The kind of clothing and gear a team member must have is dictated by the climate in the area. Most search teams require their members to have sufficient clothing and gear to enable them to stay in the field for at least 24 hours.

Clothing

- Sturdy hiking boots
- Sturdy work gloves
- Head cover(s)
- Gloves and/or mittens
- Socks and sock liners (and extras)
- Inner layer of basic underwear* and long underwear* (bottoms and top)
- Middle layer(s) for warmth (pants* and shirt*)
- Outer layer for wind and water protection (bottoms and top with hood)

(Waterproof/breathable clothing is recommended. Items marked with an asterisk [*] should be made of wool or a warm synthetic fabric. Remember: "Cotton kills.")



For more information about first aid, see the *First Aid* merit badge pamphlet and the *Boy Scout Handbook*.

When preparing your gear, be sure to take into account the weather, temperature, and potential storms.

Fabrics for Outdoor Wear

Wool can keep you warm even when it is damp from rain. If wool feels scratchy against your skin, wear long underwear or a T-shirt beneath it.

Cotton is good for warm, dry weather. Once wet, though, cotton will not keep you warm. That can make it dangerous to wear on trips when conditions might turn chilly, rainy, or snowy.

Many *synthetic* fabrics offer the comfort of cotton and the warmth of wool. Clothing made of polypropylene, polar fleece, and other modern materials can insulate you whether it is wet or dry.

Gear

- Pack or container to carry/hold the required gear and clothing
- Eye protection (such as sunglasses or goggles)
- Food for 24 hours (should be high in caloric content and able to sustain your energy over a long period of time)
- Water (2 quarts minimum)
- Swiss Army knife or Leatherman multitool type knife (one that has several blades and other attachments)
- Fire starter
- Compass with 5 degree accuracy
- Map of search area
- Whistle
- Signal mirror
- List of phone numbers including the number for Incident Base



- Two light sources (flashlight and/or headlamp, plus extra batteries and replacement bulbs)
- Personal first-aid kit
- Space blanket
- Pencil or pen and waterproof paper
- 20 feet of 1-inch tubular nylon webbing

The following items are optional:

- Tools needed for particular functions such as navigation, record keeping, marking, and communication
- Subject find and stabilization supplies, such as basic first-aid equipment and an extra space blanket to keep the subject warm; these can be based on weather and availability of medical services
- Safety equipment, generally including an ANSI Class 2 vest and other equipment required by command team



Practice Scenario 3

At approximately 9:15 p.m. Sunday, a Scout was reported missing at summer camp. He was last seen hiking back to the troop campsite after the Sunday evening opening campfire. He is a Second Class Scout, 11 years old, and dressed in Scout shorts, a T-shirt, and tennis shoes. It is his first time at this camp and it is his first summer camp. The limited information available makes it extra challenging for SAR officials.