

MODERN SURVIVAL

Field-book Series

Book 6
Rescue Essentials

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About this booklet

The Modern Survival field-book series has been designed to accompany the on-site course available through the Campcraft Outdoors Field School (campcraftoutdoors.com) and the online Modern Survival course through the Old World Alliance (oldworldalliance.com).

Alone, we believe this booklet series will transmit a great deal of insight regarding modern survival skills and how they will make your outdoor adventures safer, more meaningful and instill and greater confidence in your ability to endure when the worst conditions are against you.

Basic Search & Rescue

Basic Search and Rescue consists of three primary topics: Search, Rescue, and Survival/Patient Support.

Search

The Search information begins with the theory and philosophy of searching for a lost subject and proceeds into the skills and resources concluding with the application of specific search tactics including how to perform land search.

Rescue

Rescue, at this course level, is not intended to teach you how to necessarily perform any type of rescue, but to educate those who will probably be involved in a rescue situation. Some of the equipment and terms used will be presented so students will be able to identify commonly used equipment. Rescue is a highly specialized field of study with technical specifications in numerous areas ranging from rope rescue to low-angle, high angle, air, moving water, swift water, white water, wilderness and urban naming only a few areas of specialty. At the very least, you should seek training on how

to assist in packaging a subject in a Stokes basket for wilderness pack-out, as these are the most common basket types across the country among volunteer agencies and you should know how to signal for rescuers to find and/or assist you.

Survival & Support

Having a basic understanding of wilderness survival insofar as making a temporary shelter, making fire and maintaining your own and a patients core body temperature are critical as you may be forced to provide patient care until other members of a Search Team or perhaps EMS arrive on scene.



Providing Patient Care

Laws about Search & Rescue

In all states the local division of emergency management is required to have:

- A state SAR plan
- A state SAR Coordinator
- Resources for Searches
- Date with regard to searches

In addition, most counties in every state are required to:

- Have a county SAR plan
- Have a county SAR Coordinator(s)
- Designate agencies in the county to conduct searches and rescues in the county be they independent SAR Teams or local Fire Departments.

These county activities are often organized by the county emergency management director or highest elected official such as a County Judge Executive. Please check the laws in your state and county for specific information related to SAR Laws and Team development.

Good Samaritan Laws generally speaking only apply to those not involved as part of an

organized rescue squad or other agency. Thus, you as an individual, voluntarily rendering aid to another would be protected to some measure by such laws. However, if you are actively engaged in a SAR deployment and you are part of the team, you would not be covered and would be expected to render assistance to the level your training dictates.

The Importance of Ground Searchers

Of the types of resources utilized for SAR efforts such as dogs, aircraft and satellite images, nothing takes the place of a “ground-pounder”, the lone search technician that provides actual intelligence on clues, terrain, and information that can prove whether a subject is actually in the area or not.

The Crucials

Search is a true emergency!

- The Subject may need emergency care
- The Subject may need protection from self or the environment
- The Subject may be responsive for hours or even days
- An urgent response lessens search difficulty

Search is a classic mystery that requires you to look for clues that lead to a lost subject.

Freelancers

Freelancers are those that have some SAR training or interest yet have either no formal team affiliation or appropriate agency under which to operate. They can be anyone from the eager bystander, team member from “another” department to those that just wait for things that catch their ear over the police scanner.

Freelancing is not at all well received in the Search and Rescue world. Showing up to a SAR emergency without being requested could lead to you being removed or arrested by law enforcement.

If your plan includes responding to SAR emergencies, it is best to be formally affiliated with an existing SAR Team in your county. In the event your county does not have a SAR Team, just find out the agency that is responsible for conducting search and rescue within the county and follow up there. In most cases that agency will be the local volunteer fire department.

Author's Experience:

When I became interested in Search and Rescue the nearest team I could locate was over an hour away. I still joined and completed my basic training with them, but never responded to an incident. It wasn't until a year later that I was able to track down the local agency in my area responsible for SAR activities which was the Fire Department. When I joined the fire department, I had no interest in fighting fires, but merely serving on the search and rescue team. But to join, it was required that I had at least Basic Fire training. As it turned out, I completely enjoyed the fire training and became an asset to my department and to top it off, I was the only person on the department that had any actual SAR experience. This dual qualification enabled me to take advantage of all sorts of free courses that have helped me in many areas of my career in and out of emergency services.

Clue Awareness

Clues are facts, objects, information or some type of evidence that helps to solve a mystery or problem. Search team members must search for clues in addition to the lost subject. This is because there are always more clues than subjects; the detection of clues reduces the search area and the information gained from clues may give you information about the location of the lost subject.

Be clue conscious!

- Clue seeking is a major job of the field searcher
- Clues can be found, discovered, stumbled upon, etc.
- Good clue seeking is learned and practiced frequently to develop and maintain skill level
- Opinions must be formed based solely on the information available; not by gathering information to support an opinion

Clue seeking assists us in our reasoning of the problem (finding lost subjects) by gathering all

the facts and information possible. Significant clues may provide the basis for major tactics and actions in the field.

Clue Generators (The Lost Subject)

Virtually every person that passes through an area leaves evidence of their passing. A common problem is not the lack of clues, but determining which of many possible clues actually relate to the search and are valuable. A detailed subject profile enables searchers and managers to relate a particular clue to the subject or not.

The 6 Elements of Clue Oriented Search Theory

1. The Subject or Clue Generators
2. The Clues themselves
3. The search area where clues are located
4. The searchers or clue seekers
5. Chronological order of events as they relate to the search'
6. Search methods and tactics used to locate clues

There are four messages that a lost subject can convey that a searcher must be able to detect during a search event:

1. Present Location
2. Previous Location
3. Destination
4. Total lack of clues

Have a plan to deal with any clues found. How Incident Command deals with clues found will be presented to searchers in the briefing.

4 Clue Categories

1. Physical- footprints, cigarette butts, broken vegetation, discarded items, overturned rocks
2. Recorded- summit log, trail register, boat or ATV rental
3. People- witness, family, friend, people in search area
4. Events- flashing lights, whistle, yell, etc.

The Importance of clues

- It's important to search for both clues and the lost subject
- It's important to look side to side, down to up and even behind you to gain a different perspective of the search terrain
- Another way to attempt to locate the subject is to blow a whistle or call their

name and wait to listen for some sort of response. This must be coordinated through command so EVERYONE on the team goes quite to listen.

If the clue can be related to the lost subject you may be able to discover:

- Direction of Travel
- Physical sign or mental condition
- LKP- Last Known Position

Signs

If the clue found is in cold weather and includes discarded article of clothing or equipment it may indicate that the subject is suffering from hypothermia. If the clue is found in the summer and includes empty water bottles and clothing, the subject may be suffering from hyperthermia and dehydration.

A series of clues can be linked together to tell a story, determine a direction or possible place of refuge. A clue such as a fire or shelter can give an indication as to the subjects behavior or knowledge of survival techniques. If the fire is still warm, the subject may not be far off. It's important for searchers to continually look for signs that the lost subject is trying to

communicate to them.

Signs that are intentionally recognized in groups of three are:

- Gunshots
- Fire
- Whistles
- Stacked Rocks

The following may not be in groups of three:

- Pyrotechnics (Flares, Rockets, smoke generators, etc)
- Direction of travel arrows
- Subjects with knowledge of survival techniques may utilize ground to air symbols or emergency codes such as S.O.S. Of three X's on the ground.
- Some subjects may leave behind clothing or notes along their path of travel

If the clues are properly reported to the Incident Command, then the command staff can work with the relatives of the lost subject to determine if the clues are actually those left by the lost subject; the actual travel or condition of the subject may be determined and new search area

assigned.

With the understanding of what common clue now are and how they are processed, you can leave a lot of them to maximize the potential of being found or rescued.

Search Techniques

There are three methods for determining how or where you should search.

1. Theoretical Search- this area is determined by locating Last Known Point (LKP) or Point Last Seen (PLS).

- Takes into account elapsed time from the time the person went missing until search area is determined
- Figures out how far the lost subject could have traveled
- Establishes a maximum distance within a 360 degree radius or PLS or LKP

Example: If the lost subject traveled at three miles per hour and has been missing for two hours that is a radius of 6 miles in every direction from the PLS or LKP. It would take a population of a small town to cover that mush

terrain at an 80% POD over a period of ten hours!

2. Statistical Method- this area is based upon past searches using information from subjects of similar age and condition.

- It limits the search areas based on age, distance traveled and condition of past lost subjects of similar age and types that have been found
- While this method is an improvement over the theoretical method, experience search managers also utilize deductive reasoning to determine which areas to search first

3. Deductive Reasoning – the search area will be limited or expanded based upon factors such as barriers to the lost subjects travel.

- Rivers, lakes, cliffs or other areas where subjects are not likely to go are balanced against things that may attract the subject to alter their paths for easier travel or places of interest
- If someone went hunting, where's the best hunting spot?
- If someone went fishing, where's the best fishing spot?

- If someone went hiking, where are the best trails?

Patterns

The initiation of search tactics takes place at the same time as establishing the search area. Search tactics are categorized as:

- Passive- Confinement and Attraction; you make subject come to you
- Active- You find the subject

Passive Techniques may include:

- Smoke
- Lights or Fire
- Sirens
- Whistles
- Horns
- Loud Speakers

Confinement Techniques may include:

- Point control at road and trail intersections
- People coming out of an active public search area are asked about clues they may have found
- People going into search area are asked to keep an eye out for clues and

- evidence of the lost subject
- Running roads and trails with ATV's, mountain bikes and on foot maintains a workable perimeter and search vein activity

The 4 Active Types of Search

Type 1: Rapid Response to areas of high probability of detection by immediately available resources.

Criteria: Speed

Considerations:

- Assumption is you are looking for a responsive subject
- Provides an immediate show of effort
- Can help determine search area by gathering information or locating clues
- Clue consciousness is critical
- Often results in where not to search further
- Pre-planning is crucial for effective use and deployment of resources

Techniques:

- Investigation (Personal, Physical Effort)
- thorough checks of LKP
- Follow known or suspected route
- Running Trails
- Perimeter Check
- Sign Cutting
- Road Patrol
- Check area attractions
- Check area hazards
- Check drainage's
- Run Ridge Tops

Most Effective Resources:

- Investigators
- Trained Hasty Teams (Rapid Response Searchers)
- Mantrackers
- Dogs (Air Scent, Trackers)
- Aircraft (Unless area is heavily wooded)
- Every other mobile, trained resources: ATV's, Horse Teams, Snow Mobiles, etc

Type 2: A fast systematic search or a high probability segment of search area using techniques that produce high probabilities of detection per searcher hour of effort.

Criteria: Efficiency

Considerations:

- Often employed after Type 1 efforts in some segments of search area, especially if Type 1 found clues
- May be the initial search tactic used in search segments, particularly heavily vegetated areas
- Should be used when subject responsiveness is still expected to be high
- Type 2 efforts are often effective in locating clues

Techniques:

- Used primarily in specifically defined search areas
- Used to follow up in a segment where a clue has been found
- Uses an open grid with wide spacing between searchers
- Search routes are often followed using compass bearings

Most Effective Resources:

- Investigators

- Clue conscious teams
- Dogs (Air Scent, Tracking)
- Mantrackers
- Sign Cutters
- Aircraft
- Grid Teams

Type 3: A slower, highly systematic search using thorough techniques.

Criteria: Thoroughness

Techniques:

- Closed Grid or Sweep Search

Most Effective Resources:

- Trained Grid Searchers

Type 4: A slow systematic (finger tip) search very similar to an archaeological gig. Also known as an Evidence Gathering Search. Once a clue is found a string is run on a datum and baseline.

Criteria: Extremely Thorough

Considerations:

- If not done properly, evidence could be destroyed as well as the crime scene
- Requires a lot of man power
- Very time consuming

Techniques:

- Search teams wear protective clothing and knee pads and start searching in grid squares, working their way forward
- Once an object is located, the position is triangulated back to the datum point
- Police want all evidence photographed, tagged and bagged by their exhibit officer

Sweep Searches

Different types of sweep searches have been developed by Martin Colwell of Canada. The type of search depends on the assumption as to what the subjects condition, clothing, ability to communicate and mental status may be. The most frequent search used for a lost subject who is able to communicate is the sound sweep.

Sound Sweep: For persons thought to be alive and responsive a loud speaker broadcasts blasts over a timed interval as a beacon to draw subjects toward it. 5 seconds of radio silence

follows after each blast to listen for sounds from the subject.

Standard Sweep: For adults and children wearing normal colored clothing (neutral visibility).

High Visibility Sweep: For persons known to be wearing high visibility or brightly colored clothing, typically in more open terrain.

Low Visibility Sweep: For those known to be wearing earth tone clothing

Body Sweep: For those presumed dead.

Sweep Searchers are more common in Canada and may from time to time be utilized by certain teams trained by Canadian sources. It's becoming less common in the United States but is still found along border states to Canada.

Day and Night Searching

Your vision is obviously different in the daytime than it is at night and that difference can have profound effects upon your search capabilities.

How vision reacts to daylight:

- Pupils constrict
- Colors and fine details are seen
- Visual acuity is at an optimal level
- Images are perceived towards center of field of vision
- Scanning requires concentration, a set routine should be used (up and down, side to side)

How vision reacts to darkness:

- Pupils dilate to let more light in, meaning you will need to use peripheral vision at night and it will make your eyes longer to adjust to the darkness. Your vision will be improved as you look around instead of focusing on an object- you'll look around to perceive an outline or catch movement
- Scanning requires concentration, use the same techniques as day scanning, but view the object off center in your field of vision instead of straight on
- It takes at least 20 minutes for your eyes to adjust to the darkness
- Avoid night blindness by not depending on the beams of bright flashlights and by

not shining lights into the eyes of other team members; also do not look at the flashing lights of response vehicles

- Look for shapes, shadows and contrasting movements

Night Vision Goggles

Night vision goggles (NVG) are light amplification devices that do not work in total darkness. If you are in the deep wilderness with a thick canopy or in a cave, they are merely extra weight to pack. Additionally, they burn out when reasonable light is introduced by other searchers. Less expensive civilian models are becoming more popular and do have their merits, but generally speaking they're all too expensive and do not perform well enough for SAR use.

Thermal Imaging Devices

Thermal imaging devices detect heat sources and do not rely on light sources. They also work better for SAR applications than most NVG's available to civilians. That said, the light emitted from the screens do nothing to help searchers eyes in the night and it can at times be difficult to distinguish between a warm body and a warm, wet pile of leaves. Most Fire Departments

carry hand held FLIR (Forward Looking Infrared) devices on their apparatus, so take advantage of them should you feel the need if they become available.

Hazards of Searching at Night

- Falling off Cliffs
- Falling into holes or dry creek beds
- Eyes can become injured from tree limbs
- Bears, Snakes, Feral Hogs, etc
- Bad Weather conditions
- Trip Hazards (Rocks, Logs, Vines, etc)
- Becoming lost or disoriented yourself in unknown lands
- Fear of the dark- becoming panic stricken
- Being unprepared with improper field gear

The Lost Subject

When you find a lost subject, Notify the Authorities!

Use the Acronym L.A.S.T. When searching for a lost subject:

- L- Locate: Notify command of the search team and the subjects location
- A- Assess: Assess the subjects condition and administer first aid if needed
- S- Stabilize: Stabilize and secure the subject for extrication
- T-Transport: Transport the subject/patient to safety

If YOU ARE the lost subject, make a plan to L.A.S.T.

- L- Location of your area should be made easily identifiable. Make a mess, cut down trees and leave sign everywhere all pointing to you.
- A- Assess your equipment, health and situation. Enact survival training protocols as soon as you realize you are

lost.

- S- Stabilize any injuries you may have incurred if at all possible. Control bleeding and splint bones where needed.
- T- Think about ways you can signal for rescue and what clues you have left to lead rescuers to your present location.

SAR Packaging

Stokes Basket (Litter)

The Stokes basket is a wire or hard plastic litter designed for use over harsh terrain, on slopes and in wooded areas to aid in protecting an immobilized patient from further injury during extrication.



Packaging

Packaging refers to the process of securing a patient into a Litter or to keep them in a stabilized position for extrication be it from a vehicle or pile of debris. Typically taking the form of nylon webbing, packaging secures a patient so that even in the event of the litter being turned upside down, they will not move during transport. Packaging also includes padding areas of the body which may be injured or prone to injury from prolonged immobilization in a litter.

Preparing a Litter for Transport

- Appoint a Litter Team Boss
- Guide/ Trail clearing personnel should get ahead of the litter team and clear trail and mark paths
- Reserve litter bearers should follow the litter to rotate in to carry when one becomes tired

Lifting the Litter

- A nylon shoulder strap should be attached to the litter and adjusted should the rescuers hand slip from the litter rail so the patient does not fall
- Litter bearers all face inwards and kneel

- on knees closest to the subjects feet
- Bearers place both hands on litter rail a comfortable distance apart
- Litter bearers lift with legs and not their back
- Litter Boss gives the command: “Prepare to Lift” and bearers indicate whether or not they are ready
- “Lift” command is given only when all are ready to lift and proceed.
- Lift smoothly without jostling the patient
- Normally patients are carried feet first toward your travel objective unless going uphill in which case they will travel headfirst.

Carrying the Litter

- The litter boss gives the instructions to move in an indicated direction
- Litter bearers walk out of step with one another to avoid discomfort
- If terrain becomes too steep for good footing, the litter should be lowered and low angle rescue equipment should be employed
- If a litter bearer becomes unsure of or

uncomfortable of their footing or ability to continue they should speak up and ask the Litter Boss to halt.



Signaling for Rescue

When it comes to rescue signaling there are certain pieces of Modern Survival kit that work well for the purpose. We want both passive and active signal styles which can be employed day and night.

Passive signals are those things that work on your behalf without your constant intervention. Flags and signal panels, directional markers, flash patterns on lights and tarps are types of passive signals.

Active signals would include mirrors, flares, whistles, three gun shots, three fires, smoke generators and other types of signals which require your participation to make them work.

Universal signals are things all responders and most adults are familiar with such as SOS or series of threes, three whistles, three shots, three fires, three X's, etc.

Your passive signals work best in daylight hours as they can most often be seen without the aid of artificial light whereas your active signals can be employed anytime. Light signals from fires or artificial lights work best at night however.

The Smoke Generator

The smoke generator is the wilderness standard for revealing your location in the deep wilderness. A plume of thick smoke coming from a wilderness catches the eyes of Rangers and anyone else in the region, allowing them an opportunity to nearly pinpoint where you are.

On an overcast day when the sky is full of clouds, black smoke will be key to creating enough contrast to be clearly visible. Rubber,

plastics and accelerants will provide colored smoke. So locate trash, tires and the like to create dark smoke.

On clear days, when the sun is bright and few clouds are in the sky, white smoke will work well. To create white smoke burn living plant material and leafy, green tree boughs.



You can create a lot of smoke quickly, with a fairly small amount of green materials, so have plenty on hand to keep the smoke generating as long as necessary to signal. Smoke generators can be placed on the ground provided it's in a clearing and in an area where wildland fires are

not a major concern. Otherwise, generators should be built on a tripod, which keeps the fire above the ground or water if necessary. Create a tripod, build a platform in the center on which the fire will be built. Then, hang green boughs over top the tripod so that it sucks air in from under the fire and blows heat and smoke out the top. This is also a great technique to punch through low pressure systems which often prevent smoke from getting above the canopy line.



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