



# Search and Rescue “Field” Certification System

**New Mexico  
Department of Public Safety  
Search and Rescue**

**1997 Standards  
(Revised 11/97)**

# GEAR AND CLOTHING LIST

## *Typical Search in New Mexico*

During a typical search in New Mexico a volunteer could be asked to hike a minimum of 10 miles on a search lasting one operational period (12 hours) in an unfamiliar area on moderate terrain in temperatures between 32 and 100 degrees F at an altitude under 8000 feet.

***This list is intended ONLY to cover the basic equipment needed to respond to the above scenario.***

Searcher should:

bring what he or she would wear in the field, including hiking boots

have a pack or container for:

extra clothing

head cover

gloves or mittens

extra socks

poncho or rain jacket with hood (outer layer)

extra layers for cold/wind (middle layer)

non-cotton inner layer

[Although cotton clothing may be included in a summertime pack, each candidate for certification must also have 3 NON-COTTON clothing layers (1 each inner, middle and outer layer) as described in the gear and clothing section guide.]

food for 24 hours

water (2 quarts)

knife

fire starter

\*compass with 5 degree accuracy

whistle

\*\*signal mirror

flashlight or headlamp/extra batteries

first aid kit

space blanket

pencil or pen and paper

10' 1" tubular webbing

1 pair sturdy work gloves

\* *military or lensatic compasses not acceptable*

\*\* glass (or "mil" spec plastic) with mesh around sighting hole

# GEAR AND CLOTHING

Many factors affect your decision about what gear to carry on a specific mission. These include weather (current, predicted, and possible), terrain, the number and possible conditions of subjects, the length of time you may be in the field, and what you need for your own comfort and safety. The limits are how much your pack will hold and the weight you can carry.

Gear required for search or rescue missions is spelled out on the enclosed list. Each person in a search team should carry all of the gear on the list. In addition, the group should share the weight of items such as radios, stoves and fuel, cook kits (or at least heatable cups), medical supplies, and shelter. Remember that in emergencies, shelters can be created from surrounding materials (tree boughs, caves, rock overhangs, etc.).

Each searcher must carry at least two quarts of water. All water from streams, rivers, or lakes in New Mexico should be suspected of carrying giardia, a micro-organism you do not want in your system. Purify water from any of these sources with either iodine or an appropriate filter. It can also be boiled for 30 seconds per thousand feet above sea level.



Most search areas are isolated, so you cannot count on Incident Base to supply equipment, food, or water, especially at the beginning of a mission. If in doubt about whether to bring specific equipment, it usually does no harm to bring it to Incident Base and decide there if you will be taking it into the field.

Remember, weather changes quickly, and you need to be prepared to protect yourself from almost anything. A search route may not end up as planned - you could be diverted to another area because of clues, in order to help with an evacuation, or to support another team. What appears in Incident Base to be a straightforward route requiring four hours to cover can turn into an overnight at a moment's notice.

## **PACKS**

All searchers need something in which to carry their gear. Searchers on horseback should have emergency gear on person in case horse runs off with saddlebags. Fanny pack, in clothing pockets, etc. Also important to carry emergency gear on body if in a helicopter. A driver of a vehicle should have a duffel bag, box, or similar container which could be used if a walkout were necessary. Groundpounders need a backpack.

Backpacks can have internal or external frames. Your pack needs to be large enough to carry all required gear and any additional gear to help you care for yourself, teammates, or the subject(s), if necessary. Save room for gear that your search team needs which will be shared among the group.

It is important that the pack be comfortable to carry when well loaded. If it just hangs on your shoulders it will not be. Most of the larger capacity models have well-designed suspension systems, that distribute the weight down your back, over the hip, and across the chest with a sternum strap.

Whatever pack you carry, consider a padded hip belt and a sternum strap. If your pack lacks either of these, they can be purchased separately and put on your pack. Experiment with your pack to make sure it is comfortable when fully loaded. The fancier packs have many possibilities for adjustment and you want to fiddle until you make it comfortable for you, especially making sure that the weight does not hang mainly from your shoulders but is taken on the structure of the pelvis.

## **BOOTS AND SOCKS**

Hiking boots must be designed for hiking long distances over rough terrain. Work boots, hunting boots, or cowboy boots are not suitable. Horseback riders wearing boots with heels need to have another appropriate walking pair in their saddlebags just in case. Searchers in vehicles and those flying in aircraft during a mission should also always be prepared for an unexpected hike. Considerations when choosing hiking boots include comfort, ankle support, sole thickness, and the ability to waterproof the boot. Remember to try on boots with the socks you will wear on a mission.

Cotton socks are not suitable for hiking, even in summer. They are more likely to cause blisters, and they conduct heat out of your feet when wet - a possibly serious situation if you must spend a cold night out. Wool is very comfortable, gives good cushioning, stays warm when wet, and dries more quickly than cotton. Polypropylene works well, but it is somewhat better as a thinner inner sock than as a thicker outer.

An ideal hiking sock combination is one inner pair of thin nylon, polypropylene, silk, or wool, and one outer pair of medium weight wool (hiking sock thickness). A second set of clean dry socks in the pack (in a ziploc or plastic produce bag to keep them dry) is necessary.

## **CLOTHES**

Layering is the basic principle of search and rescue clothing. This gives you the flexibility to adjust for changing weather and activity levels. It is best to have many layers to mix and match to get just the right comfort level in different conditions, especially when hiking. The trick is to keep warm enough without sweating into one's clothes. The layers include underwear, warm middle layers, a rain layer, and a wind layer.

Anywhere in New Mexico, at any time of year, searchers may need to protect themselves from hypothermia. Even though you may be part of a four-wheel drive or horse team and believe that you will never be on foot, things happen. This certification is based on the principle that searchers must be prepared for the unexpected. You will not pass the gear and clothing check if you do not have silk, synthetics, or wool for the underlayer (next to your skin) and wool or fleece for the middle (warming) layer. You may have cotton also, but you must be able to replace it with non-cotton if it gets wet.

Wool is a wonderful material for the inner layer. It keeps its warmth when wet, is durable (especially in a blend with a little nylon which also foils moths), and is relatively inexpensive. Polypropylene, Capilene, Thermax, Polartec 100, and others are called "hydrophobic" materials (water-hating). They are almost as warm as wool, wick perspiration away from the body better than wool, and dry quickly. Polyester works also, is cheap, and gives that "Saturday Night Fever" look. Silk, while expensive and significantly less warm than wool both wet and dry, is acceptable, and often used as a layer under wool. If the above is NOT use as an inner layer you could be inviting a life threatening situation if the temperature drops below freezing or you get wet.

Remember, wet cotton (even just damp from perspiration) must be removed before any layers are added or the innermost layer can set up a hypothermia situation that endangers the whole team. If it is cold enough to need long underwear, it is too dangerous to be wearing cotton next to your skin.

One can purchase "Cool-Max", polypro, and silk t-shirts which are comparable in coolness to cotton t-shirts, but which do not need to be removed when layers are added.

The middle layers can be wool, "fleece", synchilla, Polartec 200, etc. Acrylic knits (Orlon) are inferior but acceptable. Down loses its loft when wet and is useless to provide warmth, so do not depend on just a down parka to keep you warm.

The outer layer should be appropriate to the weather. Wind protection usually means a mountain parka. A hooded, unlined (so you can use it in the summer) shell with lots of pockets and a full two-way zipper is the most versatile. If your parka and pants are not waterproof, you will also need rain gear.

A waterproof rain covering which is not breathable (a poncho, for example, or coated nylon) will keep perspiration in, and you may get wet from the inside, so carefully consider ventilation. A good addition to a poncho for leg coverage is rain chaps.

"Breathable" fabrics are designed to let perspiration evaporate while keeping rain out. The good quality garments are expensive. Check them in the shower before you go out in the rain. Wash them exactly as the manufacturer suggests, or you could lose the waterproofing.

## **HEAD, EYE, AND HAND COVERS**

If your hands or feet get cold, put on your hat; most body heat is lost through the head. Be sure your hat protects all of your head (no visors) and can shade your face when it is sunny. Hard hats are vital when doing any rock work or any time you are around a helicopter.

Ideally, some form of eye protection should be worn at all times, especially when navigating through brush or trees. Sunglasses affording UV protection are needed in sun and many snow conditions. Also consider goggles when working around helicopters, especially if there is snow which will be blown everywhere.

Hands typically will be warmer in mittens than in gloves, because the bare fingers keep each other warm. Layers often work well here.

Finally, remember the sunscreen. Even those who "never" burn should be aware that the higher the altitude, the less the atmosphere protects you.

*(Much of this article is taken from "Notes on Equipment for Wilderness Travel" by Dana Densmore of the St. John's College Search and Rescue Team. Thanks also to Sharon Angert.)*

# GEAR AND CLOTHING FOR HOT AND ARID CONDITIONS

## CLOTHING

Most reference materials on proper clothing for search and rescue missions concentrate on staying warm in wet or windy conditions and avoiding hypothermia. However, in many areas of New Mexico, we need to consider the proper clothing to wear in the field when the temperature hovers near 100 degrees and the primary concern of searchers should be avoiding hyperthermia (overheating), which is just as deadly.

The very factors which can make cotton clothing dangerous in the cold can make it an appropriate choice for hot climates. Its breathability is an asset in these conditions. Cotton will absorb moisture from perspiration quickly and wicks moisture from damp or wet areas to dry areas. Cotton dries slowly because the fibers get completely saturated and can aid the cooling of the body by evaporation. Cotton's heat conduction when wet nearly equals complete immersion in water.

Wear loose fitting clothing in hot environments to allow air circulation, which will promote cooling. Light colored clothing will reflect heat and help maintain temperature balance. Long sleeves not only help protect a searcher from sunburn, heat gain and water loss, but from various angry vegetation (cactus, catclaw and mesquite) and the inevitable contact with abrasive rock and wind borne sand. Resist the urge to remove clothing in severe heat; clothing reduces the evaporation rate and helps to slow the body's water loss.

Shorts may not be appropriate in certain areas when thorns or prickly vegetation is a problem. A dense cloth, such as denim, will protect against cactus and abrasive rock better than a thinner or more pliable cloth.

Do not, however, ignore the potential for quick weather changes in the desert southwest. Monsoon rainstorms can bring rapid and significant drops in temperature, as does nightfall. Be sure that the extra clothing in your pack will handle these situations as well.

## BOOTS

Leather boots will keep out cactus spines that the lightweight uppers such as Goretex or Cordura on many popular (and expensive) hiking boots hold in the skin while the wearer frantically strips them off.

## **HEAD, EYE, AND HAND COVERS**

Hats with brims are a must, as is sunscreen and lip balm. Comfortable searchers travel farther and see more. A bandanna can be used for dozens of things, such as bandages, a cool cloth on the forehead, sun protection for the back of the neck, and face protection in blowing sand.

Sunglasses (or more formally, eye protection) are also a necessity. The summer sun WILL cause damage to retinas over time. Exposure to bright sun, over a couple of hours, will reduce vision significantly, impairing the efficiency of the search. Exposure to blowing sand WILL cause incapacitation of the searcher, not only for that particular search segment, but often for up to 36 hours afterwards. Sudden exposure to mesquite branches near face level may cause blindness. Eye protection is one of the most important things that can be worn in desert environments. Wraparound type sunglasses (such as Gargoyles) or sunglasses with side shields (such as Bolle) are recommended.

Leather gloves are recommended, not for warmth but for protection when traversing steep or brushy terrain.

## **GEAR**

Two quarts of water will probably not be enough in very hot and dry conditions. Hard exertion in these conditions can cost upwards of two quarts of water in one hour. Seriously consider carrying as much water as is practical. Most sources recommend one gallon per day.

A shelter of some kind that can be rigged as a shade is recommended. This is used during breaks to help team members get out of the heat, to protect the subject if found, and as rain protection during thunderstorms.

*(Bob Lathrop and Ken and Mary Nelson)*