

OVERVIEW of General Testing Criteria:

Understanding some general knowledge and mastering several basic skills are important to be successful in wilderness search and rescue.

Often after a series of introductory classes students will be required to pass a written test of the material. However, when the focus is really on being good at performance skills this may not be the best approach. A more traditional form of education might be better. For centuries apprentices have learned from journeymen and masters by watching and then practicing a skill. After working with the skills, the introductory lectures will take on a new meaning and may result in increased motivation. Search and rescue involves a type of skill set and can be mastered regardless of one's reading ability and test taking skills. Students could just start using the skills with a mentor and then they will master them quickly.

In the early 1980's the National Association for Search and Rescue began their education program and started establishing standards for training. NASAR has continued with the training programs but deferred the standards' documents to ASTM. This presentation considers the existing NASAR testing process and the ASTM F-2209 training standard for search and rescue personnel. The original NASAR training committee were primarily from a fire service background in North Carolina. In the ensuing forty years technology has evolved and other skill groups have become involved. The skills tests from the 1980's should be re-evaluated and modified to meet the changing times. In some local jurisdictions, well-meaning individuals, with limited actual experience out in the field, try to develop an evaluation process that may not be very well thought out.

The following evaluation protocols will address the basic performance skills related to search and rescue field personnel. They consider the historical foundations but reflect actual needs and modern technology. With the exception of the patient transport skill, all of these are individual skills, and should not be demonstrated in a group setting. The testing process should be repeated every two years for each search and rescue member.

Equipment:

Be prepared to be in the field for at least twenty-four hours, handle unexpected changes in the weather, and have the necessary items to complete an assigned task. But you should not limit your effectiveness, because you are carrying too much weight. Consider the recommendations and choose wisely.

Land Navigation:

Be able to locate yourself on a map and use it for planning a route. Document where you are and have been, Record the information. Understand the use of a compass and a GPS unit. Demonstrate this ability in unfamiliar terrain.

Considerations for Testing Search and Rescue Personnel:

Search Techniques:

Understand how to look for clues efficiently. Their discovery can often limit the areas that need to be searched, if it is a search for a missing person. As a searcher you need to demonstrate your ability to have a high probability of success while searching along a route.

Tracking:

Being aware that the tracks or sign of a person's passage can contribute to successfully finding a missing person. Your demonstration of the basic principles of tracking will assure your awareness of this potential.

Knots, Bends, and Hitches:

Understanding their differences between knots, bends, and hitches is key to the mastery of some basic uses of rope, cord, and webbing. Knowing a few of each is beneficial and often they are building blocks in other rope related activities. Some may have problems that should be avoided.

Patient Transport:

Moving a patient to definitive care, and/or a safe area efficiently is important. Working as a team, properly lift, and transport a litter with a patient. Demonstrate passing it over, under, and through obstacles. Maneuver it down a stairwell, and through confined space areas.

Specific Skill's Testing Criteria:

LAND NAVIGATION:

The original NASAR navigation test started a subject at a point and gave them a total of five azimuths. In sequence, each azimuth was followed and both the new point and the distance to it were recorded. In consultation with John Carnes, a college level navigation course instructor with extensive search and rescue experience, his realizations of a searchers' actual needs for navigation skills are revealing and my experience agrees with his conclusions.

He feels that for most SAR folks, the only times they will be sighting bearings or walking course lines will be during trainings or testing based on a skill that was considered important fifty or more years ago. Carnes classifies his students by three different groups.

For most outdoor enthusiasts they only need to know basic cardinal directions to orient their map to the terrain and a simple base plate or 'zipper pull' compass will suffice. The next training level involves sighting at features they see in the distance in order to triangulate their current location, and a base plate compass with a mirror will improve the accuracy for that. The third group consists of a very small minority who require a high

Considerations for Testing Search and Rescue Personnel:

degree of accuracy which can only be provided with a more expensive 'look through the bezel' type sighting compass and it is probably not needed for search and rescue.

Carnes' conclusion is that the use of compass and pacing skills is to pass a test from a by-gone era. The focus of training and skill's testing in 2024 should be to master the use of a GPS unit, which are becoming increasingly common, and incorporate the GPS with a common paper map. A chosen test route must be carefully researched and practiced on, to discover any potential issues. The author located an area in a local park where a paved road route might be about two miles long and take forty-five minutes. However, a route using some obvious cross-country short-cuts and a local trail map the distance might be only 1.4 miles and take thirty minutes.

A navigation test should include UTM coordinates, local maps, and available GPS units.

1. Subject shall have fifteen minutes to locate five UTM co-ordinates with precision on a USGS map they are provided.
2. The correct locations will be confirmed by a proctor.
3. The subject will be taken to one of the five points to start and will have forty-five minutes to complete the course.
4. Using the map the subject has annotated, any local maps available, and an eye for the terrain the subject may follow roads, trails, or go cross country to each designated point and record a visible alpha/numeric symbol they will see at each.
5. Terrain and vegetation will be such that any location will not be visible from another location.
6. Using a GPS unit, that does NOT have the provided coordinates in it, the subject will create a recorded track, and each of the five locations they find will be recorded on the GPS unit as way points.
7. When the subject returns to the starting point they will show the proctor the route they traveled marked on the paper map and indicate the total distance traveled that was recorded by the GPS as well as the five documented way points.
8. It will be the subject's responsibility to set up the GPS unit they use with the appropriate units, co-ordinates format, relevant datum, and other data settings.
9. Total time spent should not exceed ninety minutes.

SEARCH:

The current NASAR search skills test has two elements. One guides on a road, trail, or other feature and the other follows an azimuth. For both, the clues are playing card size and will be located within a critical spacing band. Both courses are 100 meters (300 feet) long, but the subject must determine where that 100-meter distance ends. Each element had a fifteen-minute time limit for completion.

Considerations for Testing Search and Rescue Personnel:

NASAR also expects these tests to be done in groups of three. If the test is to determine an individual's search skills, the group format can cause a competent, visually acute searcher to fail because the guide-on person may be incompetent and unable to maintain their correct spacing position. As a result, the competent person who guides on them will be searching the wrong area and will not be able to locate the clues. For this test, to evaluate an individual's skills, it must be done individually.

Searching for clues is the backbone of any lost person incident. A study was done about twenty years ago where one hundred trained searchers followed a course to identify high and low visibility targets. One result was that only six subjects (6%) were able to locate all the high visibility targets. This shows a lack of emphasis on learning this vital skill.

Probably, the two NASAR tests are redundant and one search experience, where the subject guides on a terrain feature is enough. The targets should be about playing card size and they should be located within the appropriate critical spacing strip for the terrain chosen, covering a distance of 100 meters. The time limit should be fifteen minutes and a passing score would be locating at least 60% of the targets. The subject must determine when they have covered 100 meters. This test should be done individually so one's success is not influenced by a group dynamic. Subject will have fifteen minutes to complete task.

TRACKING:

Tracking is an extension of clue awareness. It focuses on locating evidence of the passage of a human. This can be valuable as it can support, or not, a witness statement. A line of sign can also determine the direction the person went and thus focuses search efforts in areas of higher probability of success. Even if a searcher is not a good tracker, they will know to protect a scene from contamination until a more skilled person arrives. This test does not qualify a person as a tracker but makes them demonstrate the concepts involved becoming a good tracker.

1. The subject is shown a footprint that starts the line of sign.
2. They will record basic information including the length of the print, width at the ball of the foot, width of the heel, and the length of the heel.
3. The subject will make a sketch of the observed print with its distinguishing characteristics.
4. Using a tracking stick, a subject will set it up with markers indicating length of the footprint and the 'step interval'.
5. They will then use the appropriate technique, with the tracking stick, to search for and locate the next visible footfall.
6. A minimum of ten footprints must be located in conditions where they are easily visible.

Considerations for Testing Search and Rescue Personnel:

7. Each footprint will be marked by a technique that will be visible from a distance and not disturb the print.
8. Subject will have fifteen minutes to complete this test.

KNOTS, BENDS, and HITCHES:

The original NASAR SAR Technician test for 'knots, bends, and hitches' were conceived in the 1980's by a group of SAR volunteers from North Carolina whose skills were driven by fire service training. The knots they chose were those they were most familiar with and generally were from the family of 'figure-of-eights'. Though popular, they have several shortcomings and may be outdated. When a figure-of-eight knot has been loaded it can be very difficult to untie. When doing any follow through versions an operator can forget to finish the complete retrace. All figure-of-eight versions require more rope than other choices. They are also bigger in bulk than other choices.

Maybe it is time to take a comprehensive look at how knots, bends, and hitches are used, and which one would be best for each application. The choices need to be safe, easy to evaluate, easy to untie, but are not at risk of untying unexpectedly, and use the least amount of rope or webbing. The various categories of use should be defined and then the best knot, bend, or hitch chosen to complete each need. By definition, a knot is a stand-alone creation in a rope; a bend joins two pieces of rope together; and a hitch incorporates a foreign object into a rope creation, which if removed will destroy the creation. Other definitions include the rope's standing part, the running end, a bight, a loop, and an elbow.

As more complicated rope rescue skills are mastered these rope creations will be some of the building blocks.

This test has been peer reviewed by some current active rope rescue enthusiasts. Their comments and concerns have all been addressed. It has also been reviewed by a representative of the Mountain Rescue Association.

STOPPER KNOT:

Use: Whenever ropes are deployed it is important to know where the end of a rope is so you will not slide off the end. A chosen knot must stay in place and be able to be felt.

Choice: blood knot (double overhand)

Discussion: Compact, stays in place, easy to feel, and should be placed one meter from the end of a working rope in use to alert the user that the end of the line has been reached. The extra meter of available rope provides material to resolve possible issues.

Considerations for Testing Search and Rescue Personnel:



blood knot

LOOP KNOT: (adjustable)

Use: To provide a fixed loop of a required size to secure a rope to something, often an anchor or maybe around your waist.

Choice: bowline with a retrace safety

Discussion: The created loop should be only slightly larger than the object it goes around, be that a carabiner, a tree, a person, et cetera. It is easily untied and requires less material than a figure-of-eight on a bight or a figure-of-eight follow through. The bowline's retrace safety passes the running end back through the knot and brings it out parallel to the standing part.



bowline with retrace

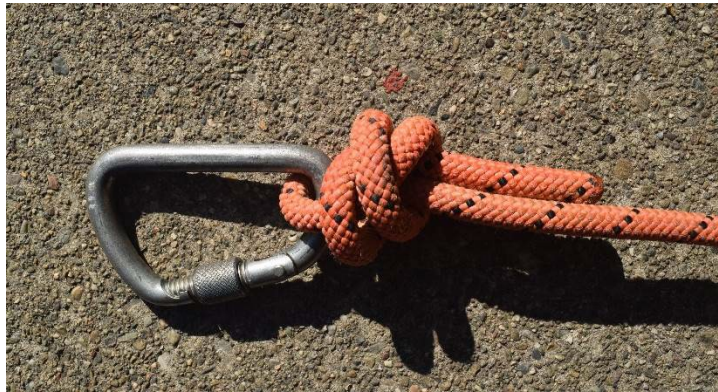
LOOP KNOT: (gripping)

Use: To secure a rope to an object in a way so the rope grips the object and will not slip.

Choice: poacher's hitch (double overhand noose)

Considerations for Testing Search and Rescue Personnel:

Discussion: Knot tightens down on object it is around, be that a carabiner, a ring, or a bar, and is very compact. It is actually the stopper knot where the standing part goes back through the knot.



BEND:

poacher's hitch

Use: Join the ends of two ropes together.

Choice: double sheet bend with retrace safety (mistakenly called 'double becket bend')

Discussion: Easily untied. Can work with ropes of different diameters. Even allows you to tie a rope to material like a tarp for example. The retrace safety passes the running end back through the knot and brings it out parallel to the standing part. Will be a building block later in creating the Blitz anchor.



double sheet bend with retrace

BEND: (alternative)

Use: Joins ropes together that are usually smaller diameters and do not need to be untied.

Considerations for Testing Search and Rescue Personnel:

Choice: grapevine bend (double fisherman's bend)

Discussion: Difficult to untie. Works best on smaller cord and cords of different diameters. Used for making Prusik loops. Requires a minimum tail of .5 cm. (1")



HITCH:

Use: Secure rope or webbing to bars and posts.

Choice: clove hitch

Discussion: Easy to untie. Works well with webbing and cord. Can be used in a series. Used in the assembly of a picket system and securing a litter.



clove hitch

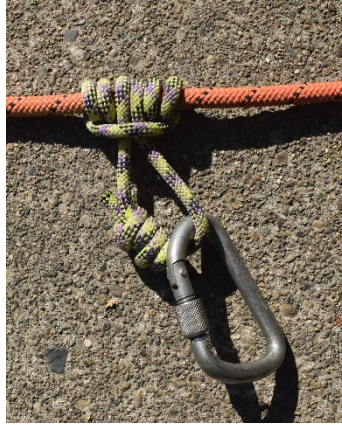
HITCH: (gripping)

Use: Gripping a rope securely at any chosen location

Considerations for Testing Search and Rescue Personnel:

Choice: Prusik hitch with three wraps,

Discussion: Loops are generally 135 cm. (53") and 165 cm. (65"), their position can be adjusted on rope before tension is applied, and extensive successful performance tests have been performed over the past forty years.



Prusik hitch

HITCH: (adjustable)

Use: Control a loaded rope in a lowering or raising operation

Choice: MB (Münter's) hitch,

Discussion: This friction hitch can be used for descent control, a belay, in work positioning, and tying off a releasable anchor. If the load is heavy, use 'double MB variation' with a second loop around the standing part. Steel carabiners are recommended when using the hitch. Proper hand motion is critical. **DANGER:** Control will fail if operator lets go of rope.



MB (Münter's) hitch

BEND: (webbing)

Considerations for Testing Search and Rescue Personnel:

Use: Tying the ends of the webbing in both the following Harness Tie and the Anchor Tie.

Choice: Flat Overhand Bend

Discussion: Pull out parallel pieces of webbing and tie an overhand knot using both pieces. Allow at least 15 cm. (6 in.) tails



flat overhand bend

ANCHOR TIE: (webbing)

Use: Construction of a basic anchor around any object.

Choice: Wrap 3 – Pull 2

Discussion: Wrap webbing around object three times and connect ends with a bend. Pull out two solid loops for anchor attachment. The connecting bend will be on the visible, load side. The best choice for the bend is the Flat Overhand Bend with 15 cm. (6 in.) tails.



W3-P2 with flat overhand bend

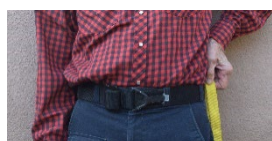
HARNESS TIE: (webbing)

Considerations for Testing Search and Rescue Personnel:

Use: Using approximately 6 m. (20 ft.) of webbing tie an emergency harness.

Choice: 'Emergency Harness'

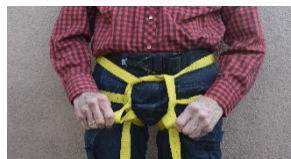
Discussion: Place the mid-point of your webbing on one hip. Webbing is wrapped around waist and one-piece wraps over the other piece twice, creating two elbows. Pull snug below navel, and the extra elbow will hold it in place. Ends that hang down will have different lengths. Pass both between legs and around thighs. On each side, pass the webbing under itself. Pull back until snug. Pass the ends back around the waist to use up all the material. The ends should be at your hip. Secure ends with a bend. Good choice is Flat Overhand Bend with 15 cm. (6 in.) tails. Connect carabiner through first double elbow and all the wraps on the waist. The finished harness will stay at waist when not under tension. If a square knot is involved in the construction, it must have overhand safety knots.



midpoint on hip



overhand with extra elbow



around thighs and under itself



finish wraps and secure.

WARNING:

All knots, bends, and hitches will probably reduce the strength of the material used by about twenty-five per cent (25%).

PATIENT TRANSPORT:

The original NASAR SAR skill's testing program had a test for 'patient transport'. About thirty years ago this skill was removed. Transporting a patient in a litter from a wilderness setting or the area of an urban disaster to definitive care is a pretty common task and can be physically exhausting.

There are techniques that can be used to make the transportation task more efficient, and a skills test will confirm that personnel are aware of them. This will be a team effort, but the proctor must make sure that every one of the team physically participates even if it means that the entire team has to repeat some skills sets.

A concern has been raised that there is a possibility of rescue personnel being physically injured during this test. The search and rescue mission requires physical

Considerations for Testing Search and Rescue Personnel:

activities and if a volunteer cannot perform them, they should not be responding to the field.

1. Use a litter with a solid bottom, not a Stokes basket. Bearers will wear gloves.
2. Use an appropriate method to secure a patient in a litter so they will not slide if the litter is tilted in a vertical orientation.
3. Using a team of about ten or more people, six of them pick up loaded litter, avoiding the use of back muscles.
4. Begin moving the litter and start a continuous rotation of bearers. An extra bearer grasps the rear of litter, bearers in front move forward and front bearer lets go and proceeds to the rear on the opposite side from where they started. This process will continue until definitive care is reached.
5. As a team, pass loaded litter over an obstacle about five feet high [fence].
6. Pass the litter through a narrow opening about three feet wide [doorway or front seat of a car].
7. Pass litter under an obstacle about one-foot-high [vehicle].
8. Transport litter down a flight of stairs, where it will have to be orientated vertically, to move it 180 degrees around a landing, before proceeding down the next flight of stairs.
9. Bearers sit with their backs to a wall and pass litter over their laps [confined space].
10. Bearers are on their knees next to the litter. In unison they pick up litter, move it forward a foot, and set it down. Bearers move forward one foot and repeat the process until the obstacle is cleared [confined space].
11. Demonstrate using a strap to help support litter weight across one's shoulders.
12. Attach a bridle to litter and drag it along the ground [confined space].