

Managing the Search Function

THE KEY TO SUCCESSFUL SEARCH OPERATIONS

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About six years ago, in a rural town, an elderly man left his home and wandered out into the rainy night. His wife quickly reported this to the local authorities. An officer took the information and filed a missing person report. The next day friends and neighbors searched for the old man, but it was not until days later that they found his body a short distance from his home. He had died from cold exposure (hypothermia) the first night.

The failure of the authorities to treat the man's disappearance as serious was tragic. Moreover, there was a competent search dog team readily available which, on another occasion, found a missing woman in the dark, within minutes after beginning its search in front of her house.

A search is an emergency.

The National Association for Search and Rescue, in cooperation with the National Park Service, has developed a 40 hour classroom course, "Managing the Search Function,"¹ designed to overcome many ill-founded traditions and myths regarding searches for lost persons. The course highlights a number of concepts that are basic to modern search theory: urgency, quick response, preplanning, search strategy and tactics.

Urgency

Central to the course is establishing urgency regarding missing persons.

¹Managing the Search Function is creditable under Peace Officer Standards and Training (POST) criteria.

Factors that directly influence the well-being of the missing person — subject profile, subject's experience and equipment, weather and terrain hazards — are all assessed. There are other considerations, but these are among the most pertinent. For example, the very young and the very old are at highest risk. Cold, wet weather and high winds create high risk. Little or no extra clothing, food or other survival gear obviously creates more risk than a well supplied backpack. A

former special forces veteran is at less risk than a retired banker who just moved to the country. And a sloping coastal plain is less dangerous than the Appalachians, Rockies or other mountainous areas.

Jim Mendonsa, a volunteer search leader and instructor at Columbia College, designed a form for an initial missing person's report which was adopted by Sheriff Wally Berry of Tuolumne County, California. The form captures the essence of urgency;



The dog's acute sense of smell makes him a valuable search tool — and part of the whole SAR picture, which includes a variety of highly skilled field personnel as well as knowledgeable search managers.

Rate the subject on the following for the next 24 hours in the area and weather conditions where assumed lost.

| | Adequate | Questionable | Inadequate |
|-------------------|--------------------------------------|------------------------------------|-----------------------------------|
| Clothing Worn | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Equipment Carried | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Sundry Items | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Age of Subject | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Area Familiarity | <input type="checkbox"/> many times | <input type="checkbox"/> 2-3 times | <input type="checkbox"/> 1st time |
| Number in Party | <input type="checkbox"/> more than 2 | <input type="checkbox"/> two | <input type="checkbox"/> one |

the more checks in the right-hand column, the higher the urgency.

Quick Response

The higher the search urgency, the quicker the response should be. This includes searching at night, to gain time on the lost person. The more time that passes, the farther the missing person can travel — and the larger the area that may have to be searched.

Another consideration that dictates a prompt response: a missing person leaves clues as he goes, in the form of footprints, scuffed dirt or broken twigs, and a scent trail. A quick response is more likely to discover these clues before they're obliterated by time and weather.

Preplanning

Preplanning is the groundwork for a successful search. A written preplan assigns responsibility for specific tasks in a search and rescue (SAR) operation, and it lists the available resources, their capabilities, and how to mobilize them. These resources could include federal, state or county agencies (forestry or corrections departments, military helicopters) as well as volunteer groups with a wide range of expertise: mantracking, high-angle cliff rescue, dive recovery, aerial search, whitewater rescue, grid search, mantrailing dogs and area-search dogs, to name a few.

Knowing what's available in advance, and participating in joint training exercises with the local SAR resources, helps things move more smoothly when a real search is called for.

Search Strategy

Search strategy, or knowing where to look, aims at narrowing the possible (or "theoretical") search area; based on how far the lost person could have traveled in any direction since he disappeared. The theoretical search area can easily encompass many square miles. By applying statistics on lost person behavior, taking into account natural barriers and other subjective factors, and by using inductive and deductive reasoning and a group consensus approach to problem-solving, a search manager can narrow

the probable search area down to a more manageable size.

Search Tactics

Managing the Search Function emphasizes the use of highly trained, clue conscious search resources, and applying these resources in the most cost-effective ways possible. Effective tactics include a thorough investigation to discover as many facts, hunches and other clues about the missing person and the circumstances of the disappearance as possible; protection of the point-last-seen (PLS) as rigorously as a crime scene because 1) it may actually turn out to be a crime and 2) the subject's footprints and scent articles may only be available or positively ID'd at the PLS. Search tactics include hasty-teams to immediately cover the most likely areas the subject could be; mantrackers and mantrailing dogs to begin from the PLS, trying to establish a direction of travel for the missing person. Tactics also include perimeter cutting (or "binary search") to dis-



In open California rangeland, the search dog rapidly covers large parcels of ground, scanning air and ground for human scent.

cover whether the subject has crossed from one part of the search area to another; confinement, to keep the subject within the primary search area, attraction (lights, sirens, PA to direct the missing person to safety); and trained grid search teams and area-search dogs, to methodically cover specific portions of the search area.

The key to effective search tactics is the use of the right resources in the right places, and the use of several different kinds of resources. The old adage about not putting all the eggs in one basket applies to modern search theory. A successful search may include helicopters, mantrackers, trained grid searchers, mantrailing and area-search dogs, and clue-conscious patrolers in four-wheel drive vehicles, ATVs or on horseback.

The Trained Nose

Dogs have been helping man for thousands of years. In modern times their usefulness has expanded to police service work, drug and bomb detection, and as guide dogs for the blind, and as hearing dogs. It's not surprising that they should be a highly effective SAR tool as well. They can cover large parcels of ground, negotiating deadfall and finding ways through thickets. Their noses alert them to the presence of people hidden from view — in dense brush, among piles of boulders, or in the dark — sometimes from as far as a quarter mile away.

Human beings, alive or dead, constantly give off microscopic scent particles. Some of these particles are heavier than air and drop by the wayside as a person walks. As they fall, they drift a short distance with the breeze and often are caught on bushes or tall grass before they reach the ground. These heavier-than-air particles constitute a person's "trail." Other particles are lighter than air and are carried on the air currents for considerable distance (a person's "air-scent").

Some dogs are trained as mantrailers, to follow a specific person's scent trail from the PLS, along the person's route of travel. The Bloodhound is the prime example of the mantrailer,



SAR dogs can team up effectively with mantrackers and sign-cutting crews. Here, a dog works up ahead in Arizona's Grand Canyon.

generally worked in harness and on-line. Other dogs are trained to "airscent," ranging through an area off-lead, scanning the air currents for human scent. These dogs are represented most commonly by German Shepherds, although many other medium-size breeds — Labrador and

deteriorates with time and weather. Temperature, humidity, wind and convection currents all affect both ground and air scent and the dog's ability to search effectively. Terrain and cover are also factors in scent transport, creating eddies, pooling in hollows, diversions, and other vagaries.

Handlers learn to assess these factors in working their dogs. A case in point was the search for a 21 month old boy in Bedford County, Virginia. When the SAR dog "alerted" at the base of a large hill, the handler judged that downdrafts were bringing scent from high on the hill. Dog and handler climbed to the top and found the toddler, off his feet, caught fast in a briarpatch.



Dogs can locate people buried under rubble from disasters such as earthquakes, tornadoes and explosions. The dog indicates his find by barking and digging.

Golden Retrievers, Dobermans, and others — have proven they can do the job. Many search dogs are trained to work both ground and air scent and can be deployed in either mode.

Just as the passage of time obliterates footprints, so the ground scent

Tactical Applications

In the initial stages of a search, mantrailing dogs or cross-trained trailing/airscent dogs can be started from the PLS to determine a direction of travel for the missing person. They can work very effectively in conjunction with mantrackers; the dog follows the wind-drifted scent trail and is rarely on the actual track.

As clues (footprints, discarded clothing or gear) are found, mantrailing dogs can be restarted from the new last-known-position. Dogs that are reliable scent-discriminators may even be used to assess the validity of a found clue.

Also in the early stages of the search, dogs can be used as hasty teams, or as part of a hasty-team, to check trails, ridgetops or drainages, and hazards or attractions in the search area. They can also work alongside other members of perimeter sign-cutting teams.

As the search progresses from a hasty (Type I) into a Type II (non-thorough area search) mode, "airscenting" dogs can be assigned specific parcels of the search area, to grid in a systematic manner. Dogs have been found as effective, on average, as 20 trained grid searchers, so large portions of real estate can be covered in a relatively short time, particularly if several dog/handler teams are on scene. A dog and handler can also be assigned as part of a Type II ("non-thorough") grid team.

Even while in an area-search mode, a dog may alert to a ground scent and shift into the trailing mode. Hasty-searching a system of logging roads in El Dorado County, California, a dog recently identified a missing woman's trail and began following it — out of the primary search area and straight down the mountain. The dog team found her where she couldn't go any further, on a boulder at the edge of the raging American River.

Dogs that have learned to seek out human airscent can be used in many situations other than wilderness or rural search for lost people. Scent rises through logjams, rubble from collapsed buildings, snow, and even water. Without a track to follow, or scent articles to identify the missing person(s) dogs can search for victims trapped in debris from earthquakes, floods, tornadoes and other natural disasters; in burned buildings or aircraft wreckage; buried in avalanches, under dirt or mud, and submerged in water.

In the aftermath of the Alpine Meadows avalanche of 1982, which claimed seven lives, a WOOFF search dog located Anna Conrad, still alive after being buried for five days under snow and the ruins of a ski lift terminal. Search dogs were used after the Wichita Falls (Texas) tornado, and the Coalinga (California) earthquake, to

"clear" certain areas before earthmoving equipment was brought in to remove the rubble. Dogs of the California Rescue Dog Association located the bodies of at least six people buried in the Love Creek and Pacifica mudslides of 1982. In many parts of the country, dogs have been able to pinpoint the location of submerged bodies of drowning victims, in some cases in water as deep as 70 feet.

Teamwork

Search dog teams can work effectively with other SAR resources. Teamed up with a mantracker, a trailing dog and handler can help speedup the often time-consuming process of following the missing person's tracks. When the pack of a backpacker lost in Coconino County, Arizona, was spotted by a helicopter, a dog team and mantracker were dropped off at the spot. While the mantracker began following the man's footprints, step-by-step, the dog trailed ahead, and the handler cut for sign in between. In this way, dog, handler and mantracker moved ahead at a rate of two miles an hour, narrowing the missing man's lead and helping establish his direction of travel. The helicopter leapfrogged ahead and picked up the exhausted man.

Dog teams can also work in conjunction with mountain rescue teams for searching areas too steep for the dogs. For example, a 20 year old hiker was reported overdue on Old Rag Mountain in Shenandoah National Park, and rangers called in both airscent dog teams and a mountain rescue unit. When the dogs gave a series of "alerts" along the base of cliffs, the climbers, on ropes, began searching the rocks and located the young man, hypothermic and severely injured from a fall.

Helping the Dog Teams

Arriving on scene, a dog unit generally comes equipped and prepared to search for at least three days. There are certain things that a search manager can do to help the dog teams work as effectively as possible.

Protecting the PLS (point-last-seen) is vital. Trailing dogs can be started

more readily from a definite PLS than if they have to cut for scent in a larger area. Extraneous people, loose dogs or other animals, and vehicles with engines running all contribute to scent contamination of the PLS.

For mantrailing (scent-discriminating) dogs, a valid scent article is important. The handler will use it to cue the dog to the scent of the missing person. To save valuable time, the scent article should be secured before the dogs arrive on scene. Unlaundered articles of clothing worn by the missing person are good, particularly articles worn next to the skin (underwear, socks, long johns). Bedding is also good. The article should not be touched by anyone else; collect it with tongs, a stick or a fork, and put it in a clean bag or carton.

Another way to help the dog teams work most effectively is to deploy them at the times of day when scenting conditions are best: early morning, late afternoon, evening and even through the night. Midday, especially in the summer, is the worst time for the dogs to work because, unless there's a good breeze, convection currents will carry scent straight up, out of reach of the dogs' noses. Handlers will be able to assess weather conditions and advise on the best times to work the dogs. The handlers will also be able to suggest the most effective ways to cover a given segment of the search area with their dogs, based on the lay of the land and vegetation.

When the dog teams come out of the field, handlers should be able to give feedback that helps with further search planning. They'll report any clues they may have found, including "alerts" that their dogs were unable to follow to the source. These alerts can be clues as valuable as the missing person's footprint. When an elderly, overweight patient disappeared from a state hospital in rural Virginia for example, searchers looked for her in all the likely places for two and a half days. At different times and in different locations, the search dogs gave a series of alerts, which were plotted on the map. Finally, on the third day,

these alerts began to form a pattern that put searchers higher on the mountain than anyone expected the missing woman could be. A search dog found her there, 84 hours after her disappearance, comatose but alive.

Multiple Coverage

Modern search theory teaches that multiple, non-thorough coverage of search sectors is more efficient, and more likely to find the lost person quickly and alive, than is the once-through-with-a-fine-tooth-comb approach. Search theory also teaches multiple coverage by different search resources. After an area-search dog team has covered one area, it can be assigned a new area — for instance, one that's just been searched by a grid team. And the grid team can then recover the area the dog team just left.

By using a wide range of trained SAR resources, concurrently and in combination, a search manager can effectively cover a large area to find the lost person in the shortest possible time.

An example of effective deployment of resources occurred when a four year old boy wandered away from a group camp at the 5000 foot elevation in Nevada County in the California Sierra. On a Labor Day outing with his family, he was wearing swimming trunks and a tee-shirt, and temperatures had dipped below freezing the night before; the area surrounding the camp was rugged, breaking off in cliffs and brushy ravines. Search urgency was high.

As dog teams began hasty-searches around the campground through the first night, Nevada County Sheriff's Department was mobilizing for a full-scale search. By first light there were 40 grid searchers, a 15 member mounted posse, helicopter, patrol boats, a mantrailing Bloodhound and nine airscent dogs on scene. The Bloodhound began trailing from the PLS, and a mantracker was assigned to isolate the little boy's footprint. Meanwhile, mounted searchers began riding trails and ridges, the chopper performed aerial search and reconnaissance, and the boats pa-

trolled the shores of a nearby lake. The primary search area was divided into segments for systematic coverage by the grid teams and airscent dogs.

The Bloodhound trailed generally west, through much of the primary search area, and several of the airscent dogs alerted where footprints matching the missing boy's were found. The grid team discovered a good print on a ridge farther to the west, and a mounted searcher found another good print in the next drainage. By this time, the Bloodhound was working into that drainage, and airscent dogs were deployed to the head and mouth of the drainage, to work inward. Meanwhile, another member of the mounted posse found sign of the little boy and followed it, discovering the youngster sitting by a hollow tree stump, waiting to be found — a mile air-distance from where he was last seen.

The use of the right resources in the right places, and a sense of team-

work among everyone involved, contributed to a successful mission.

The Nevada County search was under the direction of a SAR coordinator who was a graduate of the Managing the Search Function course. Preplanning resulted in knowing who to call. The sense of urgency was paramount, and skilled volunteers made quick response. High probability areas were searched more than once, and searchers found clues that led to finding the missing boy. Dogs were used in two modes — trailing and airscenting — and were able to cover areas that would have required some 200 grid searchers.

Good search management pays off. It includes the use of multiple resources and in almost every case will be more cost and time-effective with the use of highly trained volunteers.

Availability

There are some 45 volunteer search and rescue dog units around the



Handlers help a search dog uncover a practice "avalanche victim." Handlers observe strict safety precautions in practice burials, as they train their dogs to possibly save a life.



SAR dog teams prepare to load into a USAF Sikorsky helicopter in Alaska. In life-threatening situations, the military or Civil Air Patrol can transport trained searchers to and from a mission.

country, and new groups are rapidly being added to the list. Units range in size from small groups with one or two trained dog/handler teams to those with 15 to 20 teams on callout and additional teams in training. There are groups that use mantrailing Bloodhounds exclusively, while others use only German Shepherds trained to airscent. Many units have a number of breeds on callout and cross-train the dogs for trailing as well as airscenting. A few have both trailing and airscenting "specialists."

The volunteer units don't charge for their search services and are on 24 hour call to law enforcement and emergency service agencies. Most will not respond to requests from individuals. Many of the volunteer units do not train for criminal work and won't accept missions of a criminal nature that pose a threat to dog or handler, although they will usually participate in searches for homicide victims or for evidence of crime.

While there are, at present, no national standards of training or performance for SAR dog teams, there is a degree of uniformity because of inter-unit seminars, joint training sessions, the National Association for Search and Rescue's SAR Dog ALERT newsletter, and other forms of contact.

At a minimum, an agency should expect SAR dog handlers to possess the necessary outdoor skills: map and compass, wilderness survival, basic climbing and navigation on skis or snowshoes (where applicable). Handlers should have current first aid certification and be proficient in radio communications. And they should be competent, clue-aware searchers, even without their dogs. They should come to the search dressed and equipped for the conditions at hand.

A SAR dog unit should have some procedure for determining when a dog/handler team is ready to go on searches. Many units have standards

and evaluation procedures in writing, which are usually available to agencies on request. Handlers should also document the training process of their own dogs, and these training logs can help in evaluating the team's mission-readiness.

Agencies would do well to make contact with the nearest active SAR dog units before they need their services on a search. They can learn the units' capabilities and how to best use the dog teams, and they can form a good working relationship. If there is no unit close by, an agency can request SAR dogs through the Rescue Coordination Center at Scott Air Force Base in Illinois, (800-851-3051). In life-threatening situations, the RCC will arrange military or Civil Air Patrol transport for the dog teams. For information on the location of SAR dog units, write the National Association for Search and Rescue's SAR Dog Committee, P.O. Box 39, Somerset, CA 95684. ★