DIRECTION AND CONTROL OF THE
SEARCH FUNCTION

November 18-22, 1991
Palomar College, Escondido Campus
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SEARCH IS AN EMERGENCY

A Text For Managing
Search Operations

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AN OVERVIEW OF THE NATIONAL SAR PICTURE

by Rick LaValla and Skip Stoffel
Emergency Response Institute, Inc.

Very few individuals know or understand the national search and rescue (SAR) systems that provide response and assistance for overdue, missing or stranded people. Search and rescue is often associated with outdoor activities and people missing in outdoor environments. However, SAR is also an extremely important part of nearly every disaster or major emergency.

SEARCH VERSUS RESCUE

The term SAR denotes two separate functions. Rescue utilizes proven procedures along with a high degree of technical skill for victim retrieval. With known victims in known locations, the principle problem involves devising the most expedient method of removing that individual from danger to a place of safety and medical aid. On the other hand, search for the lost or injured subject has developed into a sophisticated science involving a great many modern investigative techniques. Statistics, probability, human behavior, interviewing, terrain evaluation and tracking are but a few of the standard tools used in modern search.

Traditionally, both elements of search and rescue have been considered together. For example, a middle aged hunter is overdue at the trailhead. Local law enforcement initiates a preliminary investigation and a search is launched for the person. Subsequent searching locates the hunter's camp, clues and ultimately the hunter in a precarious position from a fall. A rescue operation must be mounted to extricate the individual from his position and ultimately the wilderness setting. From a management standpoint, it is appropriate to consider search and rescue separately, as functions that are in many ways dissimilar but related.

It would be difficult to estimate the total demand for SAR services in the United States today. Some estimate annual numbers of missions, from all regions of the country, to exceed 100,000. The term SAR connotes emergency situations that are as varied nationally as are the responders who provide relief to persons in distress. Search and rescue programs, equipment and personnel vary geographically in accordance to local needs.

SAR can probably be best defined as "finding and aiding people in distress - relieving trauma and suffering." SAR involves a great many volunteers and covers a multitude of skills. Even though the eruption of Mt. St. Helens was considered one of the nations most catastrophic disasters, it was also the largest peacetime search and rescue operation in the history of this country.

SAR management training was designed to provide a comprehensive methodology for use by local governments involving local, state, federal and private organizations in the search for, and rescue of lost or stranded persons on land, in missing aircraft and those in the water environment as well.

Nearly every type of hazard mentioned in the Comprehensive Emergency Management Plans that exist in all states may require search and rescue. Management of these SAR operations can range from directing the actions of a few searchers in a small area to managing an effort involving hundreds and even thousands of searchers in mountainous, heavily forested, coastal or inland environments with numerous threats to human safety. Often, these larger situations also involve several political subdivisions and the coordination of both air and ground resources.
Local governments and any other agencies or organizations that participate in SAR response must have cooperation and coordination among diverse multi-skilled responders.

Many of the agencies that collectively support multi-organizational SAR responses operate under their own specific statutory authority. From the standpoint of benefit to comprehensive emergency management, search and rescue operations provide the training ground and experience building for disaster response capability at the most elementary level. Management concepts used in SAR Operations establish the foundation principles for providing direction and control of larger scale emergencies and disasters.

SAR operations have a built in motivating time factor that focuses on a successful conclusion (finding a lost subject or rescuing a person before they succumb to the effects of the environment, injuries or a specific hazard). Extremely diverse organizations can be drawn together in a time critical, life threatening situation with a commonality of purpose; much the same circumstances that exist during a community wide disaster. In the longer time frame, this course will impact and add to future training, planning efforts, and cooperation that should be expected in a fully integrated emergency management system.

**SAR - WHO'S INVOLVED? (What do they do?)**

**The National Search and Rescue Plan**

Although there are many agencies and volunteers involved with SAR across the nation, the federal government assumes some responsibilities for overall coordination, especially the coordination of any federal or military resources which may be requested to respond by local or state agencies. The National Search and Rescue Plan identifies federal responsibilities and is the basis for the National Search and Rescue Manual that discusses search and rescue organization, resources, methods, and techniques. Though guidance is provided by the federal government, local and state government agencies are expected to assume the responsibilities for initial SAR response commensurate with their capabilities and within their geographic boundaries. In general, the federal role is one of coordination between local, state, and federal agencies and to create a cooperative national SAR network.

According to the National SAR Plan, all maritime or navigable water SAR is the responsibility of the U.S. Coast Guard. All inland SAR is the responsibility of the U.S. Air Force. These two military organizations are the federal coordinating agencies for federal resources responding to SAR incidents within their respective areas of responsibility.

**Air Force Rescue Coordination Center**

The Aerospace Rescue and Recovery Service (ARRS) operates the Air Force Rescue Coordination Center (AFRCC), which is the single federal agency responsible for coordinating SAR activities in the 48 contiguous states. The AFRCC's prime mission is the coordination of SAR, both for military and civilian personnel. The AFRCC is centrally located at Scott Air Force Base, Illinois, 20 miles east of St. Louis, Missouri. It is operated 24 hours a day by personnel trained and experienced in SAR operations. The Center is equipped with excellent telephone, teletype, and hot line communications. A resource file lists all federal, state, local, and volunteer organizations capable of conducting or assisting SAR operations. However, the AFRCC is not authorized to commit federal funds to hire SAR resources. In addition, a listing of Mexican and Canadian SAR coordinating agencies is available. The Center is administratively divided into three sections; an operations section to prosecute individual SAR missions, a directorship to provide overall management and formulate SAR plans, agreements, and policy, and a reports section to maintain data and records.
Federal Aviation Administration (Missing aircraft search)

The Federal Aviation Administration (FAA) through its Air Route Traffic Control Centers and Flight Service Stations, monitor and flight-follow aircraft filing flight plans in the Inland Region. In some cases, individual citizens contact an FAA facility when they have knowledge of a probable SAR situation involving aircraft. Therefore, FAA is usually the first agency to alert the AFRCC on an emergency or overdue aircraft. The AFRCC is tied directly into FAA’s teletype network, and FAA facilities use the teletype to initially alert the AFRCC.

Once the AFRCC is alerted, the FAA and AFRCC work together in trying to determine the urgency of the situation. Initially, a review of all radio communications is accomplished with the objective of ascertaining as closely as possible the last location of the distressed aircraft. Concurrently, other FAA facilities begin a check of all possible recovery airports for the missing aircraft. The AFRCC, in the meantime, contacts relatives and friends of the pilot or passengers aboard the missing aircraft, with the hope of establishing the whereabouts of the aircraft, or to gather information on the personnel aboard. The AFRCC attempts to get a description of the aircraft, its capabilities and nuances, and also data on emergency equipment aboard and to determine the pilot's intentions. Through experience, the FAA and AFRCC have learned that the majority of alerts for missing aircraft are generated by failure of the pilot to either close the flight plan or failure to specifically inform some person or agency of his/her intentions. For this reason, only a small percentage of alerts issued by FAA result in an actual airborne search for a missing aircraft.

With the recent enactment of federal law requiring most aircraft to be equipped with an ELT, the AFRCC works very closely with FAA to readily locate the source of ELT signals. All ELT signals reported to FAA facilities are immediately forwarded to the AFRCC and jointly investigated by the AFRCC and FAA as probable distress signals.

Civil Air Patrol

Almost consistently throughout the United States, the Civil Air Patrol provides the bulk of the response to downed or missing aircraft situations. They are a private, non-profit corporation of volunteers devoted to assisting aviation by providing emergency response and aviation safety education. Upon request the Civil Air Patrol will provide to the appropriate authority in charge of the air search or rescue effort: mission coordinators; aircraft, pilots, and observers; ground search teams; base camp support; communications networks. When officially tasked and involved in a search or rescue mission, they are reimbursed by the U.S. Air Force for communication expenses, and fuel and oil expenses incurred by aircraft or ground vehicles. In addition, because they are an official auxiliary of the Air Force, all Civil Air Patrol members are covered by the Federal Workman’s Compensation Act in the event of an injury. Current statistics show that Civil Air Patrol members respond to three-fourths of all air SAR missions.

THE STATE’S ROLE: COORDINATION AND SUPPORT

All states have established enabling legislation which provides for direct support to local government entities during times of emergency or life threatening situations. Approximately 22 out of the 50 states have a state agency which is responsible for overall coordination and support to local SAR problems. This support can take many forms, but most often it is in the area of coordination and ‘one-stop shopping’ for resources. It is the responsibility of each state to establish an agency or central location that is familiar with all aspects of emergency management and the resources that are available to aid in life threatening situations. Many of the resources that can be made available belong to the state already and can be used to provide aid to local jurisdictions.

A number of states, especially in the Pacific Northwest, have established by law a responsible state agency for directing and coordinating air SAR activities. These State Departments or Divisions of Aeronautics develop and maintain their aviation search and rescue response programs with
cooperation and support from local and federal agencies. It has been our experience that this system works far superior when compared to those other areas of the country that rely on the federal government to initiate and carry out aircraft SAR activities.

If a local emergency manager, sheriff or fire chief requests outside assistance in the form of specialized teams, search dogs, air support or enhanced communications, the state agency for Civil Defense, Emergency Services or Emergency Management can locate the nearest resources available and coordinate the response in most cases. If any federal resources are needed in the form of air support or military personnel, the state agency provides a direct communications and liaison link to that resource. For instance, the AFRC CC at Scott Air Force Base in Illinois has working agreements that are updated annually with the majority of states. Technically, the resources of local and state government must have been exhausted or unable to perform a task before federal support can be rendered. However, policy does provide for immediate aid under circumstances of time critical threats and life or death situations. Much discretion is given to military installation commanders about aid to civilian authorities as long as the primary mission (military mission) of the resource is not impaired. In fact, most commanders appreciate the opportunity to fly actual missions. Access to these resources must be gained through the state and the Air Force Rescue Coordination Center.

A good example of this coordination and relationship took place recently in a state that was experiencing a major search effort for a missing child. The local sheriff’s deputy coordinating the search effort needed air support desperately for transporting searchers into higher areas and to search some very difficult terrain. Access to the area was limited and the situation was time-critical. The child was inadequately clothed for the weather conditions and several nasty fronts were due through the area within 48 hours. The Deputy also felt that several good search dog teams would pay high dividends within several of the designated search areas.

A request for helicopter support was made to the State Department of Emergency Management. There were no private or commercial helicopter resources in the surrounding area. (Military aircraft cannot fly a mission of this type if civilian resources are available in the area, especially if it takes business away from private enterprise.) The state agency made a call to the AFRC CC and requested support from a base that was located over a hundred miles north of the county where the search was being conducted. They also asked if the aircraft could detour slightly in their course and pick up two search dogs and handlers. In less than forty-five minutes from the original request, Air Force helicopters were air-borne. The dogs and their handlers were transported to the search scene and participated in the search. The dog teams were ultimately successful.

Every state’s emergency management agency is responsible for support, guidance, training and coordination to local political subdivisions within that state. As such, it provides a vital behind-the-scenes effort in helping local jurisdictions prepare for emergencies, to include SAR. The state also initiates laws that are necessary to enhance effective actions for SAR response. Such legislation often indemnifies volunteer SAR teams, provides for their medical coverage and insurance, and in some cases also replaces personal property lost during volunteer SAR work. Although most volunteers willingly work until the job is done, this recognition and coverage by the state often provides additional incentives for volunteer participation.

THE LOCAL RESPONSE

The official response to the call for a wilderness SAR is usually delegated to a political subdivision within the state. The legal responsibility for SAR is generally vested with the county sheriff or chief law enforcement officer at the local level, but may vary with region or state. In some cases, state police agencies have the responsibility, while land management agencies in other areas have had to assume those functions. The SAR response for any given jurisdiction may differ greatly from another. For instance, many national parks in some areas of the country have chosen to respond and handle all of their own SAR incidents. In others, they jointly manage the function, and in yet others rely on outside resources entirely. National forest land is managed entirely by forest service personnel, but this federal agency only supports the functions of the local sheriff's

AN OVERVIEW OF THE NATIONAL SEARCH AND RESCUE PICTURE
department in the area of SAR.

In urban areas, police, fireman, emergency medical technicians, and civil defense emergency organizations maintain some degree of disaster/emergency readiness through daily missions, which involve search and rescue work. Fire departments have historically been responsible organizations instituted for rescue and response to emergencies within geographical or political areas. Many are augmented by volunteers. Law enforcement agencies also maintain full time, efficient response systems designed for their own particular SAR requirements. Ambulance and rescue vehicles operated by a variety of private enterprises or volunteer organizations augment existing local government services. Through local emergency response planning and coordination, these services respond to a spectrum of everyday emergencies including fires, collapsed buildings, hazardous material spills, vehicle extractions, and home medical emergencies. Every emergency physician and rescue group should be thoroughly familiar with their own area and support systems.

Rural areas have urban counterparts: county sheriff's reserve law enforcement; volunteer fire departments; and a variety of volunteer and rescue units determined by specific local SAR problems. Delivery of search and rescue aid to rural and wilderness areas often presents many special logistical problems compounded by distance, terrain, and weather. The demand for wilderness SAR is often seasonal and unpredictable. Volunteer Mountain Rescue Units, Explorer Scout Search and Rescue Groups, Search and Rescue Dog Teams, Civil Air Patrol Squadrons, Motorized Units, and many types of Volunteer Composite Teams (teams having a variety of capabilities), are usually formed locally as a result of the type and nature of recurring SAR problems.

Regardless of who does it or regardless of the types of recurring or potential SAR emergencies, effective, initial SAR response must be developed by a local effort and should consist of those resources and responders that will be close to the emergency situation. State and federal resources are subject to time lag, distance, weather and logistics. The same storm or disaster that incapacitates a local area also prohibits outside (and sometimes inside) emergency response and re-supply deliveries.

Although official agency response may differ greatly around the country, one major factor remains constant. That is the dedicated and unfailing willingness of volunteers to respond and work until the job is done. The volunteer effort in SAR nationwide is the backbone of aiding people in distress - so poignantly stated in the rescue service motto, "That Others May Live". This volunteer response has proved crucial to wilderness type situations. Volunteer organizations, communications and special skills are not replaceable through any "official agency" resources.
COURSE INTRODUCTION

OBJECTIVES: A student will be able to--

- Discuss the course agenda/topics.
- List the course objectives.
- Describe his/her personal objectives for attending this course.

1.0 SEARCH MANAGEMENT: RATIONALE

Reduced to simplest terms, there are three elements that will influence the success of a large search. One is the resources. Obviously if the right people, equipment, and other resources (dogs, trackers, aircraft, etc.) are readily available, the chances for a successful result are higher than if not. Another element is strategy and tactics -- the way in which the resources are used. The third, and most critical, is the function of management.

The objective of a search mission always has been to find the lost person in the best possible condition. But circumstances nowadays dictate that we must accomplish this efficiently, effectively, and economically. Efficiency is doing things right -- meaning, perhaps, well-trained resources. Effectiveness is doing the right things right -- well-trained resources combined with good strategy and tactics. What pulls all this together and makes it run smoothly, and therefore economically, is good management.

It is important to understand that economy, as it's used here, does not necessarily mean to cut out something. One thing nearly everyone will agree on is that when a human life is at stake, no amount of skimping is acceptable. Economy is something that will result when the mission is being managed well.

Aside from the general high cost of everything these days, economy is tremendously important to consider because of the vast amounts of time (the majority of which is volunteered) that are expended on large searches.

Economy isn't the only reason for good management on a search. The chances of finding the subject also will be improved, because good management creates opportunities and causes things to happen.

The stark fact is that good management still is lacking on most searches. There is commendable effort, but many problems still exist and we are approaching their solutions unrealistically.

Good management consists of capable people who know what to do (given a set of circumstances) and who then carry out an
action plan through other people. Knowing what to do is obviously a key. One way to begin to develop competence in management is through training.

2.0 THE SEARCH MANAGEMENT WORKSHOP

PURPOSE: Training, Idea Exchange, Suggest Guidelines

GOALS: Subject Orientation, Organization, Efficiency, Effectiveness, Innovation

NEED: Mission Load, Response Time, New SAR Organizations, Lack of Existing Materials

3.0 SCOPE

The course has been designed to function as a forum that provides an "information rich environment". By utilizing current texts, articles, research documents, plus the combined experience and knowledge of the instructors and course participants, a maximum learning environment is created.

3.1 The ultimate goal of the course is to improve search management awareness, capabilities, coordination, communications, and planning.

3.2 Teaching techniques maximize the use of case histories and practical problem solving exercises.

3.3 The course is designed to be of vital interest to any agency or organization, whether professional or volunteer, who have search and rescue interests, responsibilities, or capabilities.

3.4 Search management tenets are described generically so that the widest possible application will result.

3.5 The course uses SAR research and case studies to identify past mistakes with the expectation that future problems will be minimized.
4.0 OBJECTIVES OF THIS COURSE; a student should be able to:

4.1 Manage a search.
4.2 Discuss the elements of a search preplan and describe its importance to a successful mission.
4.3 Identify the basic types of search and rescue resources and discuss their function and limitations.
4.4 Describe the various tactics that can be used to search for lost persons.
4.5 Describe the resources and sequence of initial action in applying SAR resources in order to locate the missing subject.
4.6 Describe the functions of effective search organization.
4.7 Demonstrate the ability to establish probable search area in a given map problem.
4.8 Identify the key factors involved in deciding to suspend a mission.
4.9 Discuss the importance of preventive search and rescue programs.
4.10 Describe the function of clue detection as it relates to search theory.

5.0 ASSUMPTIONS ABOUT THE MANAGING SEARCH OPERATIONS COURSE

5.1 Active participation will enhance learning.
5.2 Each course participant is expected to focus on identifying his/her own learning needs, and to seek solutions from the course's "information rich environment".
5.3 Each participant is expected to share knowledge and to learn from other participants.
5.4 Participants will need to take risks, especially by admitting that they "don't know", and to constructively seek answers.
5.5 The numerous small group activities will be successful only if each group member actively participates.
STUDENT ASSIGNMENT:

INSTRUCTIONS: What you get out of this course will depend on your needs, your level of expertise, and the amount of effort that you put into learning. To get the most out of this training, you should clearly understand your own reasons for taking this course and what you expect to gain from it. Review the objectives that you have just read, and write your own personal objectives for taking this course in the space below. Use additional paper if necessary. Be prepared to share several of your personal objectives with the class during the formal introductions that are coming up next.

MY PERSONAL OBJECTIVES ARE:
WHO ARE YOU WORKING FOR DURING A SAR MISSION?

BY: Robert Mattson

Are the following attitudes, statements and perceptions really true?

1. If you know what you're doing in SAR, you're not welcome at the mission base; you ask too many embarrassing questions!
2. If someone has developed an effective program for SAR, he will jealously guard against anyone "stealing" it!
3. The new "guy" in SAR doesn't feel he needs to study or to be trained. He doesn't have time to listen to the old timers.
4. The "old heads" don't need to look at the books; they've been doing it their way for years. They don't keep up-to-date with new techniques, and certainly don't have the time to listen to some young fellow who's experience is limited.

Do these things happen? Do these attitudes exist? I'm getting rumblings that they are commonplace. Why? Why? Why? Who are we working for????

You dedicate hours of your time and much money for SAR. But, who are you working for? I'll give you some help. You're not working for the Air Force, HQ CAP, the wing commander, your unit commander, the emergency services officer, the state, the sheriff, the FBI, your family, nor even yourself.

If you think you are working for one of these, you're in the wrong business! **You only have one person who really matters on a SAR mission, and that person is the POTENTIAL SURVIVOR.** I use the word potential because if you don't work for the survivors they may never be saved.

Everyone involved in the SAR effort must feel the same way, and when they do, you will all work together for the benefit of the survivors. However, when people think they're working for themselves, place their position and role first, and refuse to cooperate with others, there will be NO SURVIVORS.

Working for the survivor does not mean that each person does his own thing; rather, it means that each individual acts in cooperation with others involved in providing aid to the survivor.

This may require you to keep out of the way, to allow others to assist. It may mean accepting a support role which is out of the mainstream of the total effort. It means sharing your knowledge with others; helping them to become more proficient. It means listening to others who have new and better ways to solve our SAR problems. New ideas and methods are coming into our SAR business very rapidly.

At other times it may mean working with, or for, someone you really don't care for. (This is difficult, but it may be best for the survivor.) **We should ALL be working for the survivor ALL the time; there is no room for anything less!!!**
THE EVOLUTION OF SEARCH MANAGEMENT

It's been over thirteen years! Hardly seems that long; although there's been a lot of hard work. There has also been many good times. And good people. And now it's clear that some lives have been saved. That makes it all worthwhile.

It all started in 1973. We hadn't even met each other yet. (Some think it was a mistake we ever did). Bill Wade was working as a Training Specialist at the National Park Service's Albright Training Center in Grand Canyon. Rick LaValla was working as Assistant SAR Coordinator for Hal Foss in Washington's State Department of Emergency Services. It was that year that the training budget at Albright included some money for development of training in "search and rescue". Nothing definite -- just search and rescue.

In trying to determine how best to use this money, Bill informally surveyed a number of persons active in SAR in the NPS. Gradually, it became clear that those areas that had a technical rescue problem (high angle rock, snow and ice, underwater, etc) had implemented very sophisticated techniques, equipment and action plans to cope with the rescue emergencies. Most areas had highly trained persons readily available, either on the park staff or from close by volunteer SAR units.

On the other hand, it became more and more obvious that the same was not true for plans and techniques for searching for lost persons. Bill decided to pursue efforts to organize a training course in "search".

Having earlier worked at Mount Rainier, Bill had become acquainted with some of SAR's more distinctive personalities. He knew that one in particular - the late Bill Syrotuck - had been dabbling in a number of different aspects of searching for lost persons. Syrotuck had a very analytical mind and was looking for ways to improve the effectiveness of searching.

During the latter part of 1973 and early 1974, Bill assembled a myriad of resource materials and suggestions for topics that many thought needed to be addressed in a course. A great deal of time was spent with Syrotuck.

It was determined that the inefficiency and ineffectiveness on searches was not due to the actual searching skills but rather to the overall management - the ways techniques, patterns and support activities were implemented.

In researching these considerations, some exciting new concepts came to light. Syrotuck had begun assembling data on the behavior of lost persons. Jon Wartes (Washington State Explorer Search and Rescue) was experimenting with the relative effectiveness of various search
patterns - in terms of "finds". Syrotuck and others were investigating ways of establishing manageable search area segments and means of assigning values representing the probabilities that the subject might be in each defined segment.

About this time, Dennis Kelley published his classic book, *Mountain Search for the Lost Victim*. This was the first definitive reference on search and consolidated all information relevant to the activity.

Air-scenting dogs came into their own as a very effective resource in locating lost persons. Ab Taylor and Jack Kearney (U.S. Border Patrol) made a big splash (some might describe their presence differently) on the scene by showing how human tracking and sign-cutting techniques could contribute to determining where the subject "wasn't". Confinement considerations became important. Dennis Kelley became a strong vocal advocate for searching for "clues" rather than the subject - and "clue-consciousness" became a common term.

All of a sudden, it seemed it was possible for a person in charge of a search mission to have a bunch of new tools available. "A lot of new things were happening", and *Search Management was born!*

Bill pulled all these things into an agenda for a five-day course. First conducted at the Albright Training Center in the early fall, 1974, it was primarily for NPS rangers. But several "outsiders" were there, including Rick. And a number of experts, including Syrotuck, Kelley, and others were used as resource persons in conducting the course.

Although it got rave reviews, there was still a tremendous amount of work to be done to improve the course. This process was hastened by an unfortunate coincidence. Hal Foss, SAR Coordinator for Emergency Services in Washington died on a climb of Mt. St. Helens, and Rick stepped into that role. He was able to promote and coordinate the presentation of the course - with improvements - for Washington State SAR folks in August 1974. In 1975, Rick and Skip Stoffel, who was also working at Washington State Emergency Services, compiled the first cut of a student textbook from articles, professional papers, books and other assorted SAR resources that were available from around the country.

The NPS conducted the course again in Grand Teton NP, Wyoming in September 1975, and funded a collateral meeting of the more prominent "Search Function Researchers", among whom were: Syrotuck; Lee Lucas of China Lake, California SAR Team; Kelley; Bob Mattson from the USAF and National SAR School; and Jon Wartes. As a result of this meeting and other followup actions, the concept of probability calculations and manipulating variables to accomplish desired results in searching began to take on a more important role in the course. Now there were ways of predicting and even influencing results that were dependent on the effectiveness of resources and the ways in which they were used. Order of use and specific search patterns began to be important for resource application.
Several more courses were put on during 1975 through 1977, each with refinements from those done earlier. A turning point came in May 1978, when Jim Brady, who had replaced Bill Wade at Albright convened a working session to organize the instructional materials for the class. After this it became clear that the course was solid enough that its availability could be expanded. Hand-picked instructor candidates were brought together at Albright, not only to learn more about instructing the course, but also to critique the newly drafted instructor manual that had been prepared. Significant input had been contributed by Brady and many others.

During the summer of 1978, Washington State Emergency Services received a small contract from NPS to pay for secretarial support and one month of Paul Green’s time to edit the instructional materials. Paul was a professor at Eastern Washington University. Also during that summer, Gene Fear of the Survival Education Association received contract from NPS to produce 50 sets of overheads and slides to support the proto-type instructor manual that was being edited by Green. (It is interesting to note that at this time there was still no student text as we know it today.) At the conclusion of Green’s efforts, these first written instructional materials were printed up at a Government Printing Office, and Fear delivered the overheads and slides to Albright Training Center. Armed with these new materials, in September of ’78, Brady convened the first formal instructor workshop at Albright for 40 NPS personnel.

By late 1980, there was a definite need to upgrade the course content and produce a more definitive student text. Early in 1981, the newly established Emergency Response Institute received a personal service contract from NPS to develop a student text and a field coordinator’s handbook. For the better part of a year, Brady, LaValla, Stoffel and Wade worked to rewrite, organize and edit the materials in the existing student text into a compendium of information that could be used as an independent resource for search management. In addition, the instructor manual was also revised again. The money in the NPS contract paid only for production costs and was not used for wage compensation to anyone for developmental time. The contract called for the delivery of 25 sets of the materials to Albright Training Center, NPS. These materials were published in late 1981, along with one other important publication; a booklet that a mission coordinator could have in his hip pocket for quick reference, the Field Coordinator’s Handbook.

Because there was no apparent source of funding a mass production of these newly developed instructional materials, Gene Fear generously came forward to not only run the first two production printings of the books on his backyard press, but he also personally funded all the artwork that was used in the overheads and student materials. Permission was granted to the Emergency Response Institute for exclusive use of this copyrighted artwork in the publishing of those training products. Ongoing retail sales have now provided for nearly all the recoupment of the publishing and development costs incurred for that production. The 1987 revision and update was solely supported and facilitated by the Emergency Response Institute.
Perhaps one of the hallmarks of the course has been the progressively improved use of "map problems". We always felt that people needed something more than just lecture and slides. They need hands-on experiences to which they could apply the management concepts as they were being learned. The many map problems now being used are actual searches with a variety of resource, environmental and logistical considerations. Using the group problem-solving approach, these problems have proved to be highly successful in reinforcing important concepts.

Over the years our involvement with the training and association with the vast numbers and experiences of persons involved in SAR, we have identified several key concepts of search management. We believe that the extent to which each is effectively performed on a search mission will have a direct influence on outcome of the search. These key concepts are:

- Pre-planning.
- Investigation.
- Clue Consciousness.
- Search Area Confinement and Segmentation.
- Proper Application of Resources.
- Use of Overhead Team.

We also know, from researching a number of searches, that several "manager-deficiencies" seem to occur on search after search. These are:

- Failure to Lead.
- Failure to Know Resource Capabilities and Availability.
- Failure to Take Risks.
- Failure to Take Proper Actions Immediately After First Notice.
- Failure to Properly Delegate.
- Failure to Properly Document Search Activities.

These continue to occur. But we know that search management training is making a difference. We are aware of searches where the concepts were properly applied and the deficiencies were fewer. Documentation of these missions shows vast improvements in terms of effectiveness and economy. *And we're convinced that all this has resulted in more lives being saved!*
NOTES:

YOU ARE WORKING FOR THE LOST SUBJECT
THE SEARCH MANAGER: THE JOB AND RESPONSIBILITIES

OBJECTIVES: A student will be able to--

* Identify the common mistakes made by a search manager.
* Discuss solutions to the common mistakes.
* Describe the key elements of managing a search.
* Discuss a framework for situational leadership.

1.0 THE MAJOR RESPONSIBILITY OF THE SEARCH MANAGER IS SEARCH MANAGEMENT.

Search Management: Providing the leadership necessary to effectively coordinate work efforts of others to find lost person(s).

1.1 The overall job of the search manager is leading the entire operation, from start to finish and obtaining results.

1.2 The search manager is responsible for getting the right things done at the right time with and through other members of the search organization.

2.0 WHY IS SEARCH MANAGEMENT SO IMPORTANT?

2.1 Search management, by definition, demands leadership. Without someone in charge and "managing" the overall function, there is nothing but confusion, resulting in a misdirected and disjointed effort.

2.2 If search management is so important, then why doesn’t it work better? When a search effort is not well planned, organized, coordinated and executed, it is usually due to the search manager:

a. Who misunderstands the nature of the job.
b. Who is not able to perform and is unknowledgeable or uninformed.
c. Who does not care.
d. Who has insufficient experience.
e. Who does not understand the liability that comes with the job.
2.3 The common mistakes many Search Managers make, and how to avoid them.

A heavy load of responsibility rests on the shoulders of the on-scene Search Manager. Those around him/her look for support and direction. Interested observers expect him/her to be a SAR professional. In many respects the overall success or failure of the mission depends on his/her judgement and SAR experience. In light of this, it is to your advantage to be aware of the following common mistakes and how to avoid them.

a. Common Mistake #1

Lack of proper preplanning or failure to follow recommended procedures. We are a very optimistic country. We don’t plan for the worse SAR case, or the catastrophic disaster. Then when it happens we expect the force of the moment to pull us through.

Better

Devise a preplan and stick to it! The thinking through of "what if" possibilities before an emergency actually occurs is not only good practice, but it gives you a decided edge when an actual emergency occurs. Especially if you stick by your plan. In this way, most of your thinking has already been done for you before you’re put under pressure to act.

b. Common Mistake #2

Use of wrong resources in the wrong order. The classic example: the first team responding for a missing person, in their haste to find him, trample over the clues. Then first responder resources, (such as dogs and trackers), are brought later to try to pick up the pieces.

Better

Set up a thorough training program! In order for your searchers to do a good job, they must be trained to do a good job. Proper training is the backbone of any good mission and provides discipline and direction.

c. Common Mistake #3

Failure to provide visible leadership. This is a problem that is most likely to occur in large missions where several agencies are involved. It also occurs where a particular type of emergency has not happened before. In situations such as these there is frequently confusion as to who will take overall command and provide a course of actions for all units to follow.
Better
Set up an effective organization. Give yourself a good perspective of the operation. Clearly identify yourself, as "the place the buck stops". Choose a visible location and STAY THERE. Don’t spread yourself too thin. Good communications between your headquarters and your field operations will allow you to control the whole operation.

d. Common Mistake #4

No adequate system of relief for fatigued leaders on long missions. After long hours in the field, pressures of the job can bring on mental fatigue long before physical fatigue becomes noticeable. The situation is further complicated if no previous arrangements have been made for a capable replacement who has kept up to date on the developments of the mission.

Better
Ensure adequate depth of overhead staff. Never try to run a "one-man show".

2.4 The end results of the above problems are all basically the same. They increase the risk of accidents, lead to reduced effectiveness of the mission force, and increase the possibility of failure for the mission as a whole.

With proper attention paid to preplanning, communications, staff and training, the Search Manager can swing the balance of success to his/her corner. At the same time; improve efficiency, limit liability and make the job easier in the long run. In other words, it puts him/her in the proper position to get the job done -- and save lives -- which is the bottom line!

It is always easier to get forgiveness than permission.

3.0 THE KEY ELEMENTS -- Job Responsibilities of Managing a Search.

3.1 Many people who become Search Manager are highly qualified in a particular search skill - such as:

- Communications,
- Air Operations,
- Planning,
- Running Search Patterns,
- and/or related areas of specialization.
AND...they may assume that the job of the search manager is more of the same. In large, complex search operations, seldom will the Search Manager perform specialized search field skill abilities. He/she must, however, apply search management knowledge skills and abilities.

3.2 The specific search management core skills needed are:

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<tr>
<th>Coordination</th>
<th>Logistics</th>
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<tr>
<td>Planning</td>
<td>Communications</td>
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<td>Decision-making</td>
<td>Ground Forces</td>
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<td>Supervision</td>
<td>Air Operations</td>
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<td>Evaluation</td>
<td>Strategy/Tactics</td>
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3.3 Often, what we do not like about management is not the functions involved, but rather, the "actions" of the people who perform the job.

Crucial to results-oriented search management is the ability to deal effectively in directing the work of others.

Consider: As the search manager, your product is the released energy of other people. Your performance (as search manager) is measured by the accomplishments of other people.

Effectiveness in dealing with people hinges around communication skill and ability. People must know the what, where, when, how, and why of their search responsibilities.

4.0 WHO SHOULD BE THE SEARCH MANAGER? varies from: "No one wants to be in charge" to "Everyone's in charge."

4.1 Organizations with search responsibilities should identify, select, train, and otherwise prepare Search Managers as well as an overhead team that can train and work together -- in advance of the anticipated missions.

Use of the overhead search team concept can prepare team members to become Search Managers and enhance the overall ability of the organization to manage progressively more complex search operations.

4.2 Regardless of how you got the job -- appointed, selected, volunteered -- the job of a search manager demands that you take charge and be responsible for results.
5.0 OVERALL, THE JOB OF THE SEARCH MANAGER CAN BE SUMMED UP AS FOLLOWS:

**JOB of the SEARCH BOSS (mgr.)**

- Recognize that you are in charge
- You are responsible for getting things done... through/with people

"The job"

- Plan
- Organize
- Coordinate
- Supervise

HOW? /
THRU YOUR LEADERSHIP/EXPERIENCE

Create and maintain an internal working environment—in which people can work together effectively and efficiently.
6.0 LEADERSHIP-- THE ACTIVATING INGREDIENT.

6.1 Situational Leadership -- It has been said that management can be taught but leadership can't...It has to be learned through experience.

And we know that in any given search situation, the characteristics of the lost person, terrain, available resources, and skills of the search personnel will vary (often dramatically) from search to search.

Study, assessment, and answers by you of the four questions posed below will provide a framework for situational leadership. The answers allow you, as search manager, to adjust or adapt your own personality and leadership style to any search operation. Adapt the kind of leadership required for this mission in order to manage people and obtain results.

Situational leadership poses four questions:

(1) What are the characteristics of the leader?
(2) What are the characteristics of the followers?
(3) What are the characteristics of the organization?
(4) What are the characteristics of the environment?

6.2 Some specific leadership considerations for search management.

1. Identify key people. Leaders must be identified and obviously marked (uniform, peacock feather in hat, etc).

2. Everyone must know "who is in charge"!

3. You must exert your authority, by taking action and being responsible for decisions.

4. When the organization/search effort is large, you have to delegate and use subordinates.

5. Identify locations of key functions in base camp.

HOW CAN I MAKE
A DIFFERENCE?

Organize AND
Manage, Dammit!!

- QUALIFIED PEOPLE
- OVERHEAD TEAMS
6.3 What do SAR volunteers expect from the on-scene Search Manager?

- An awareness and understanding of their capabilities and expertise.
- To be given an idea of what they are expected to do (what is their mission?).
- A briefing on the over-all plan of action.
- An opportunity to provide input into the search plan by having key volunteer leaders involved in planning sessions.
- To be provided adequate briefings and on-going information.
- To be adequately debriefed.
- To be invited to constructive critiques.

6.4 What does the on-scene Search Manager expect from SAR volunteers?

✓ Organization.
✓ Discipline.
✓ Cooperation.
✓ Advice.
✓ High Performance Standards.
✓ Proper clothing, equipment - the ability to be self-sufficient.

7.0 CONCLUSION:

By personalizing and using the key elements and framework of effective SAR management and leadership presented here, you, as the Search Manager, can make a difference.

"Whatever hits the fan will not be evenly distributed"

From the Disaster Research:

Four common mistakes during emergency operations:

1. Ambiguity of authority.
2. Poor utilization of specialized resources.
3. Lack of good interagency communications.
4. Unplanned media relations.
THE THEORY AND PRINCIPLES OF LAND SEARCH

Successful Search is Rooted in Strong Fundamentals

SUCCESS
TACTICS & TECHNIQUES
STRATEGY ORGANIZATION

THEORY of SEARCH
THE PHILOSOPHY AND CONCEPT OF EFFECTIVE SEARCH MANAGEMENT

OBJECTIVES: A student will be able to--

※ Discuss the fundamental principles of effective search management.

※ Describe the six 'crucials' of search theory.

1.0 "Search and/or Rescue" (SAR) means the searching for or rescue of any person(s) who become lost, injured, or killed while in the out-of-doors, or as a result of a natural or man-caused disaster.

1.1 What is the total demand for SAR response? How many SAR missions are there per year?

a. We really do not know. There is a lack of both data and a national reporting system.

1.2 SAR can happen in any "hostile" environment. Urban areas can become a wilderness during storms and disasters. SAR techniques have application to any emergency.
2.0 **SEARCH VS. RESCUE** - For purposes of this course, we must define and separate these terms.

2.1 **THIS IS NOT A RESCUE COURSE**

This course will focus on the procedures, techniques, and management of finding lost people.

---

**SEARCH - OVERDUE, MISSING SUBJECT**

**RESCUE - KNOWN SUBJECT, IN A KNOWN LOCATION**

**BOTH ARE - TIME CRITICAL**

The hope is, a Successful Search will end in a Successful Rescue.
2.2 **WHY DO WE SEARCH?**

a. - Legal Reasons?
   - Moral Reasons?
   - Humanitarian Reasons?
   - Curiosity?

2.3 For some SAR operations, the state-of-the-art has progressed to a high level.

   a. Examples: Scuba SAR and Air SAR.
   b. Many rescue techniques, procedures, and equipment are fairly well defined and developed.

2.4 The state-of-the-art for Land Search is currently behind rescue in development, but there are a lot of new things happening.

   a. This course, for instance!

---

**WHY DO WE SEARCH?**

**LEGAL - MORAL - HUMANITARIAN - CURIOsITY?**

**HOW ARE WE DOING?**
3.0 The most important component of SEARCH MANAGEMENT is an effective SEARCH MANAGER. There are a lot of different titles, so remember it is the function not the title.

3.1 Why is a Search Manager needed?

a. To provide leadership, management, decisions, directions.

b. Qualifications:
   - Ability.
   - Knowledge.
   - Willingness.
   - Acceptance.
   - Humility.

THE SEARCH MANAGEMENT WORKSHOP

PURPOSE: TRAINING, IDEA EXCHANGE
         SUGGEST GUIDELINES

GOALS: SUBJECT ORIENTATION, ORGANIZATION,
        EFFICIENCY, EFFECTIVENESS,
        INNOVATION

NEED: MISSION LOAD, RESPONSE TIME,
      NEW SAR ORGANIZATIONS, LACK
      OF EXISTING MATERIALS

3.2 A Search Manager should be able to:

1. ESTABLISH OBJECTIVES
2. ESTABLISH PRIORITIES
3. EVALUATE RESOURCES
4. DEVELOP A PLAN OF ATTACK
5. DELEGATE RESPONSIBILITIES
6. DEVELOP RESOURCES
7. COORDINATE EFFORTS
8. EVALUATE RESULTS
9. DEVELOP NEW PLANS

A graduate of this course should be able to perform these functions.
4.0 THE THEORY AND PRINCIPLES OF LAND SEARCH.

THE Crucials:

1. Search is an Emergency
2. Search is a Classic Mystery
3. Search for clues, not the subject
4. Concentrate on aspects that are
   - Important to Search Success
   - Under control of a Search Manager
5. Know if the subject leaves the Search Area
6. Grid Search as a last resort

4.1 Search is an Emergency.

a. Because:

   - The subject may need emergency care.
   - The subject may need protection from himself and/or the environment.
   - Time and weather destroy clues.
   - An urgent response lessens the search difficulty.

b. It is often hard to justify urgency because a certain percentage of lost people, if left on their own, would survive and walk out.

c. A quick response means putting searchers into the field to minimize search area size. The search area size can grow larger with each hour.
d. The **chances of success** are directly related to **search area size**.

![Diagram showing easy and hard search areas with text: So... how is search area determined?]

**Search Area** is the potential maximum distance traveled by the subject.

![Diagram showing point last seen, mobile subject, and time leading to search area]

f. **Nighttime** gives searchers a unique opportunity to confine the subject while he/she is (usually) immobile.

"Next to creating life, the next most important thing man can do is to save one."

- A. Lincoln
g. To respect the search subject's emergency, **you must**:

1. Respond urgently.
2. Search at night.
3. Mobilize and keep searchers in the field.
4. Create an atmosphere of positive urgency.

"Negative slack tends to increase"

4.2 **Search is a Classic Mystery.** - Finding a lost subject is like a plot in a Sherlock Holmes novel. All of the clues are there if the Search Manager properly investigates, interviews, and assimilates.

   a. You must know what clues to look for.
   b. Possible destinations must be determined.
   c. Points last seen must be identified.
   d. The missing incident must be re-created.
   e. The subject could return home or show up at friends, etc.

4.3 **Search for Clues, not Subjects.**

   a. There are more clues than subjects. Every subject on land leaves clues such as scent, tracks, and other disturbances.
   b. Clue detection substantially reduces search difficulty.
4.4 Concentrate on Aspects that are Important to Search Success, and under the Control of a Search Manager.

a. It is a waste of time, energy, effort, and money to do otherwise!

THE SEARCH MANAGER

WHY IS HE NEEDED?
- Leadership
- Management
- Decisions
- Directions
- Feedback

QUALIFICATIONS:
- Ability
- Knowledge
- Willingness
- Acceptance
- Humility

BARRIERS TO PROGRESS
- Tradition
- Inaccurate Data
- False Economy
- Poor Training
- Afraid to take Risks
4.5 Know if the Subject Leaves the Search Area.

a. A search without a subject is nonsense.
b. Search difficulty increases rapidly unless you confine the subject.
c. Include prominent non-search areas, i.e., home, etc.
d. Assign someone to do the "Bastard Search."

4.6 Grid Search as a Last Resort.

a. Because the cost/benefit is significantly greater than for other techniques.
SEARCH THEORY IMPLEMENTATION IS THE REDUNDANCY THAT ASSURES SUCCESS WHEN SHORT-CUTS FAIL!

The crucial/s:
1. Search is an Emergency
2. Search is a Classic Mystery
3. Search for clues, not the subject
4. Concentrate on aspects that are
   - Important to Search Success
   - Under control of a Search Manager
5. Know if the subject leaves the Search Area
6. Grid Search as a last resort

YOU ARE WORKING FOR THE LOST SUBJECT
EXAMPLE MISSION

OBJECTIVES: A student will be able to--

* Discuss this particular example mission, and identify the various search phases, and functions that had problems, deficiencies, or omissions that may have kept it from being successful.

This example mission was chosen because of its extreme complexities, and the fact that everything that could go wrong, did. The purpose is to help provide an overview of the course, by pointing out "what went wrong". We want to avoid the traditional attitudes and mistakes of the past.

STUDENT ASSIGNMENT: As you read this case study, make note of the following:

- Preplanning.
- Initial Response.
- Use of Resources.
- Logistics.
- Dealing with influences, Family, Media, Political, etc.
- Ongoing planning.

How well were these things done?

THE DENNIS MARTIN SEARCH
GREAT SMOKY MOUNTAINS NATIONAL PARK
JUNE 14 - SEPTEMBER, 1969

AN EXAMPLE MISSION

DAY 1, SATURDAY, JUNE 14

Dennis Martin, 7 years old, was last seen at 4:30 p.m. in the Spence Field area on the Appalachian Trail. Initial information:

♫ Last seen wearing a red T-shirt, short green trousers, and low cut oxford shoes, with a simple heel.

♫ He was a quiet boy, and would not normally call out, but he would respond to his name being called even by strangers.

♫ He was in a special education group at school, his mental age was a half year behind his chronological age.
Dennis, his nine year old brother, and two other unrelated boys had been playing near the Spence Field Shelter.

His father later stated that he began calling and looking for Dennis 3-5 minutes after he last saw him.

Some of the trails were quickly checked out by the Father and Grandfather.

The Grandfather hiked out to report Dennis missing and arrived at the Cades Cover Ranger Station at about 8:30 p.m.

Brief description of the Spence Field area:

- Two shelters.
- The Appalachian Trail runs east and west through Spence Field.
- Two trails and one jeep road lead from Spence Field to other destinations.

Initial search actions after Dennis was officially reported missing:

- Family members and one other hiking group in the Spence Field area continued to search.
- Three rangers from Cades Cove checked the Cades Cove area, the trails from Cades Cove to Spence Field, and interrogated any hikers they found in the area.

*ALL RESULTS WERE NEGATIVE, NO CLUES FOUND*

A heavy rainstorm, about 2.5 inches, occurred at Spence Field at dark. All streams are high and turbulent.

The three rangers and family members continued to search the immediate area the rest of the night.

*NEGATIVE RESULTS*

The Chief Ranger was notified at 8:40 p.m.

The Park had no detailed search and rescue plan in existence.

Plans for the next day's search efforts begin:

- Base Camp will be at Spence Field.

Resources:

- 1 crew, 30 men with 5 leaders.
- 10 crews, 2-4 men each, and 10 leaders.
- A helicopter will be obtained if weather permits.
- Additional Park Service personnel, local rescue squads, and hiking club were contacted to provide manpower. They were asked to be at the Bote Mountain Road at 5:00 a.m.
DAY 2, SUNDAY, JUNE 15

❖ The weather is moderate.

✓ Nine jeeps and three trucks are used to transport searchers from the Bote Mountain Road to Spence Field, 7 miles away.

✓ Searches of the trails continued, and initial searches of drainages began as more search personnel arrived.

✓ All hikers and campers spotted in the area were interrogated.

✓ A large helicopter was acquired and was used to haul equipment for the base camp at Spence Field.

❖ The total number of search personnel on day 2 was 240.

★ There was poor coordination and inadequate food and water for the personnel involved.

DAY 3, MONDAY, JUNE 16

❖ The trail and drainage searches continued.

✓ Many of the areas already covered were searched again, especially the immediate drainages in the Spence Field area.

❖ An intensive grid search of Spence Field was conducted.

✓ A heliport was established at Cades Cove, and several military helicopters arrive.

★ The news media arrives in force.

✓ 40 Special Forces Troops, self-contained with communications, are requested.

✓ Hundreds of offers to help search were received from individuals and groups.

✓ Two bloodhounds arrive and are used during the day.

✓ Some overhead team coordinator positions were designated.

✓ The Red Cross establishes a Food Service operation for searchers at Cades Cove.

❖ The total number of people involved on day 3 was 300, including personnel from the Park, the local rescue squad, the Air National Guard, and other volunteers.
DAY 4, TUESDAY, JUNE 17

✓ The trail searches were extended, and the field drainages were searched and re-searched again.

✓ Another heliport was established at Russell Field.

✓ The intensive grid search around Spence Field was expanded by adding 50 student searchers from a Junior College.

⊗ Additional NPS overhead teams were alerted.

→ 50 Tennessee Air National Guard personnel with two HH-53 helicopters arrive, and join the search effort.

← The North Shore of Fontana Lake is patrolled and searched by boat.

→ Another heliport was established at Cades Cove.

→ The helicopters were unable to fly until 11:00 a.m. due to fog.

⊙ Weather: rain continued in the area.

★ Meals for searchers began to be served at a Job Corps Center.

♫ The total number of searchers on day 4 was 365, including 149 people from 20 different county rescue squads, 40 special forces military personnel, 50 junior college students, 75 NPS personnel, and 51 assorted volunteers.

DAY 5, WEDNESDAY, JUNE 18

♫ The grid search of Spence Field continued utilizing 97 searchers.

→ A fixed wing aircraft with a loud speaker system was requested. Upon landing at Cades Cove, the rear landing gear hit a rock and was knocked through the rear stabilizer, rendering the aircraft unuseable. After repairs, it returned to its base.

✓ Small groups of searchers had camped in various areas overnight (Tuesday), building large bonfires in hopes of attracting the boy.

✓ An over-abundance of unsolicited food, including a semi-truck/trailer of lettuce, began to arrive.

♫ 22 more Special Forces personnel arrive.

⊙ Weather: it rained during the previous night, and there is a 4,000 foot ceiling.

→ Four helicopters are in the area, but are unable to fly due to weather.

★ Large numbers of predictions by clairvoyants begin.
An operations center for search activities is set-up at the Cades Cove maintenance building.

The special forces establish a communications unit.

The total number of searchers on day 5 was 615.

NOTES FROM THE FIRST STRATEGY MEETING - Wednesday, June 18, 1969, 9:00 p.m. Park Headquarters.

*Chief Ranger:

- Unable to transport men - Bote Mountain Road bad shape.
- Need more helicopters, at least two more.
- Expect crescendo by Sunday.
- Rescue squads not physically prepared but doing their best.
- Helicopters use jet fuel, not aviation gas. Losing time flying to base for fuel.
- Reaching cut-off point on field operations on Tennessee side; should turn to North Carolina personnel for expansion of search personnel and area.
- Don’t worry about technical accuracy on grid search; keep men moving.
- Helicopters nullify need for huge base camp at Spence Field.
- What about sanitation in Spence Field area?
- Mud is more than wheel-deep on jeeps.
- Diverting every volunteer into North Carolina, concentration on North Carolina.
- Another operations center in North Carolina? What about Hazel Creek dock? Fontana dock?
- Want map to show area covered daily for reference so we can record all areas covered and all possible effort made.
- If we ever have this situation again, we will have a press coordinator on the scene to deal with reporters.
- FBI Agent Jim Rike checking Martin family background for possibilities.
- Should pursue extra helicopter request; six or seven by Sunday?
- If grid is negative, boy is somewhere in low country.
- Tell select leaders to watch for circling buzzards and note any odors.

*Assistant Superintendent:

- Need to schedule this on normal work loads for personnel daily.
- When cut-off begins of NPS personnel, maintenance gets first priority due to heavier costs.
- We will have something going on this for weeks.
- Boy had been covering several miles, capable of covering several more miles.

*North District Ranger:

- Impossible to keep records complete on top.
- When will contributions cease? Will we be prepared when they do? (food, etc.)
- Have plenty of jeeps now.
- Another rain will "kill" jeep road.
- Ten jeeps is maximum number for operations on jeep road.
- 200 persons about maximum for jeep transport.

*Park Forester:

- If boy got out of Spence Field, could he have mistaken Little Bald for the field?
- Special Forces said that they are here indefinitely.
- Helicopters were not getting in to Spence Field today because of 4,000 foot ceiling. They could have landed at 3,800 feet. A few heath balds in the area may be available for helispots. Will have them investigated for possible helipot.
- Reluctant to do any extensive clearing on heath balds.
- Good helipot available near Haw Gap (heath bald) on Jenkins Trail Ridge.
- Need to designate the following positions:

  *Plans Chief
  *Operations Chief
  *Ground Traffic Officer
  *Air Traffic Officer
  *Communications Officer

Problem: You arrive at a base camp. No apparent authority. Several people are in competition. What do you do? Advice: "Wait until the battle is over, then side with the winner!"

(Only a joke, folks.)

**DAY 6, THURSDAY, JUNE 19

❖ All grid searches, and searches of drainages and trails continue.
❖ Predictions by clairvoyants increase and the Martin family believes these are significant. The media has many of the predictions and there is heavy public pressure to check-out all of them.
✔ All animal excrement found is checked, and all buzzards are watched.
❖ The use of airborne infrared sensing devices were discussed, but then dismissed as impractical.
❖ The total number of searchers on day 6 was 690.

**DAY 7, FRIDAY, JUNE 20

❖ Additional NPS overhead team personnel arrived during the night.
✔ An additional 200 Army National Guardsmen are called in.
✔ All grid and drainage searches continue.
❖ There is continued, substantial pressure by the press, radio, and television media.
❖ The total number of searchers on day 7 was 780.
NOTES FROM A STRATEGY MEETING HELD ON FRIDAY, JUNE 20, 1969, 8:00 p.m., Park Headquarters.

NPS and Special Forces

Chief Ranger set up Plan A (if found alive) and Plan B (if dead). Under Plan A the boy would be taken by helicopter to the Knoxville Hq. of the U.S. Marine Reserves and then by ambulance to University of Tennessee Hospital. Under Plan B the Blount County Coroner should be invited to come in.

Instructions to finders of boy:

1. Determine if dead or alive (dead only if rigor mortis has set in).

2. Notify Chief Ranger by most expeditious means available and give:
   location in detail, dead (radio code 10-200), or alive (radio code 10-100-A).

3. Climb tree and set flag, build smudge fire, use smoke bomb (military only), or other signal for helicopter.

4. Stand by while Special Forces rappel a man in by helicopter and secure boy in litter if alive, or if dead, guard area until released by Chief Ranger or coroner.

5. Get name and address of person or persons who found boy.

Plans Chief stated that the top country was pretty well covered now. Additional helispots will be set-up at Russell Field, Thunderhead, Derrick Knob, Gregory Bald, Eagle Creek, Hazel Creek, and Fontana. An auxiliary operations center will be set-up at Fontana for the North Carolina operation.

The Superintendent issued an announcement that the Laurel Creek Road will be closed at the Townsend "Y" over the weekend, and bona fide searchers will be transported from the "Y" to Cades Cove by bus convoys.

DAY 8, SATURDAY, JUNE 21

✓ A road block was established at the Townsend "Y" at 5:00 a.m. to control the entry of volunteers. The volunteers waited long hours in line, and many never did get into the search area. Those that did not get in were very agitated.

→ Two Chinooks, and four other helicopters airlifted 600 searchers to Spence Field.

✓ A search area one (1) mile in radius from Spence Field (approximately 3 square miles) has been completely saturated. All immediate and logical ridge tops have been searched. All immediate drainages have been covered 250 feet up on each side.

☞ The total number of searchers on day 8 was 1,400 from 35 different organizations.
DAY 9, SUNDAY, JUNE 22

- The road block for traffic control continued.
✓ The volunteer turnout was not quite as heavy.
● Estimates of the total area searched was 56-3/4 square miles, with 13-1/2 square miles receiving intensive coverage.
✓ It was felt that all logical search areas had been covered, and nothing was found. The decision was made to begin all over again on the morning of June 23. Search crews will start at Spence Field and re-search the entire area.
⇒ The total number of searchers on day 9 was 1,000.

DAY 10, MONDAY, JUNE 23

- There were heavy rains in the area.
✓ The helicopters were unable to fly, and a police dog was used with negative results.
● The total number of searchers on day 10 was 427.

DAY 11, TUESDAY, JUNE 24

⇒ The FBI continues their investigation.
✓ Two more dogs are used, with negative results.
● The total number of searchers on day 11 was 482.

DAY 12, WEDNESDAY, JUNE 25

⇒ A press release was issued stating that the search operation will be greatly reduced as of June 26. Then, if the boy is not found by June 29, the search will continue on a limited basis only for 60 days.
● The total number of searchers on day 12 was 463.

DAY 13, THURSDAY, JUNE 26

✓ The Martin’s telephone the Chief Ranger stating that they now feel that Dennis may have been abducted. They referenced a particular individual who had been camping in Spence Field when the boy disappeared.
● The total number of searchers on day 13 was 121.

DAY 14, FRIDAY, JUNE 27

✓ One of the Martin’s neighbors in Knoxville had telephoned a Tennessee Senator asking for 300 Federal Troops to search for a week. The White House was monitoring the search effort. The decision was to accept the Federal troops, if offered, largely due to the NPS being accused by a Tennessee Representative of not wanting/accepting outside help. These facts were considered in extending the search effort.
● The total number of searchers on day 14 was 68.

DAY 15, SATURDAY, JUNE 28

⇒ The Park was notified that the family was considering offering a reward.

Vulture activity over Sugar Cove was noted, and when it was checked out, it was discovered to be a dead bobcat.

The total number of searchers on day 15 was 196.

**DAY 16, SUNDAY, JUNE 29**

- All search operations for the day concentrated in an area from Spence Field to Russell Field.
- At 5:00 p.m. a meeting was held with the Martin's, the FBI, and the NPS.
- The operation was closed down by 6:00 p.m. All searchers and equipment was brought out of the area. A captain of a county rescue squad severely injured his back when he fell against the rear bumper of a refrigerated truck.

The total number of searchers on day 16 was 318.

**NOTES FROM THE STRATEGY MEETING HELD ON SUNDAY, JUNE 29, 1969, 5:00 p.m., Park Headquarters.**

At 5:00 p.m., a meeting was held at the operations center with Mr. and Mrs. Martin, FBI Agent, Chief Ranger, District Ranger, and Sub-District Ranger. The question discussed was "where do we go from here?" Points discussed:

1. Absence of evidence to support kidnapping, etc. FBI cannot launch a full-scale investigation, but investigation, as is, will continue; search will continue.

2. Reward; FBI cannot say yes or no - up to the family.

3. Chief Ranger assured Martin's we were prepared to continue search 30-60-90 days with three of our best men, who also can handle volunteer searchers.

**PREDICTIONS, SUGGESTIONS, AND SUSPICIONS**

**PREDICTIONS:**

From Jeanne Dixon, Washington, D.C.: "Look around area where boy was last seen playing. He went out on level ground, went down (was walking, did not stumble or fall) incline and turned off to left at 40-50 degree angle and up a little, then went back down and would be underneath point of incline. The area where he turned left has shrubbery and is thickly. Did not see any trees where he veered off to left, more or less bare ground."

Harold Sherman, Los Angeles, California: "He will be found 2-1/2 miles to left of where last seen by father or brother. Fell off steep place. Hung up in bushes."

Jeffrey Owens, Gatlinburg, Tennessee: "Had dreams last two nights about lost boy. In dreams he is not very far from where lost. Night before last saw him lying on hill behind a log, but last night dreamed he had dragged himself down to the river for water."

There were numerous other predictions, and the family was most receptive to these.
SUGGESTIONS:

A Mr. Billy Noland, Psychic Interpreter of New Orleans, La., arrived on 6/25/69; talked with the family and headed for Rocky Top on the Appalachian Trail.

On 6/26/69 Carson Brewer of the Knoxville News-Sentinel called and forwarded a suggestion received from a lady telling us to start looking in trees and treetops - stop looking on the ground.

Telegram received on 6/22/69 from Glen Chandler, Rt. #1, Mascot, Tennessee: "Take several friendly dogs including the boy's own, put package containing food and plastic raincoat around their necks. Release dogs 1-2 miles apart. Be sure dogs are lost same as Dennis. By chance one may find his trail and follow him for friendship. Dogs could be released by helicopter. Thank you."

Info called in to Cades Cove Store, caller unknown: "Two branches go through Spence Field and come together. There's a hole. You have to step in it to know its there. Fern growing out of it."

A Betty Phillips of Townsend, Tennessee, called to say a boy was seen by himself at Elkmont by a waterfall by Joe Jones who lives in a trailer court, first trailer on left marked private, at Walland. Turn right at King's Grocery and cross bridge to trailer court. We can check this by calling Joe Makee, a preacher, at Walland.

ALL OF THE ABOVE WERE CHECKED AND RECHECKED: NEGATIVE RESULTS

Memo to Chief Ranger from Secretary: "Issac Welch of the Indian Agency talked with me Sunday AM at the information desk about the possibility (don't laugh) of using the powers of an old Indian he knows to locate Dennis Martin. The Indian is not a tracker, but possesses special power and, with these, has located people before. It would be necessary by jeep or plane to transport this man to Spence Field. If interested, phone Welch's number."

SUSPICIONS:

The Martin family had suspicions concerning several persons, especially during the latter stages of the search.

(John Doe), Dandridge, Tennessee: Mr. Doe was one of the parties camped at Spence Field when Dennis was last seen. He stayed with Mr. William Martin during most of the search. A lady, unknown, claiming to possess E.S.P. had gotten in touch with Mrs. William Martin through the Miami, Florida, Police Department and told her that Mr. Doe should be watched. (FBI Agent checked on this lady.)

Mrs. Martin felt that the lady in Miami and Mr. Doe, or others, could possibly have taken Dennis for reasons unknown.
Billy Noland, Psychic Interpreter, New Orleans: Was here without funds and equipment. Wants permission to stay in area for several days. Is sure he can find boy. (Without funds, food or shelter!)

Carter Martin, other Martin camped at Spence Field: Could someone have gotten the two Martin families mixed up and "kidnapped" the wrong boy?

As stated before the FBI has no evidence to start any large investigation on any of this. The fact should be well noted that the family possibly does not want to accept the possibility that the boy will not ever be accounted for.

Knox Youth Missing in Spence Field Area

GATLINBURG, June 16 (Special)—Search for a 7-year-old Knoxville boy, lost on a hike in Great Smoky Mountains National Park late Saturday, continued today. Dennis Martin, son of Mr. and Mrs. William Martin, 738 Murray Rd., Knoxville, was believed somewhere in the rugged Spence Field area, 18 airline miles from Gatlinburg, near the North Carolina border, where the family had gone on an outing last Friday. The father is a Knoxville architect.

Weary park rangers and other volunteers crisscrossed the region today in their search. Two helicopters were ready to help them when fog lifted.

The helicopters, flown from Ft. Benning, Ga., Sunday night, were to be manned by rangers, directing searchers on the ground.

The helicopters were at McGhee Tyson Airport awaiting word that the fog and mist over the mountain had cleared enough.

Transfer to Jeeps

Trucks and other vehicles were being used to take searchers some 71⁄2 miles from Cades Cove along the Bote Mountain trail where they were transferred to jeeps for another mile drive before beginning search on foot at Spence Field.

Trail motorists, which some members of Vestal United Methodist Church had wanted to use in the search yesterday were not allowed because of the treacherous conditions of the trails.

Mr. Martin described his son as "quiet," and the type who wouldn't yell for help, according to the rangers' report. However, Mr. Martin indicated Dennis would answer if he heard somebody calling him.

Some 100 persons were officially listed as members of the search party this morning. Fifty of the searchers were from the Florida Ranger Training School who were visiting in the Smokies, and volunteered their aid.

The search was centered in heavy woods and at elevations up to 5000 feet. The forests are laced with streams and inhabited by black bears and other wildlife.

The mountains have been drenched by rain for the past two nights, with temperatures in the 50s.

Search Resumed

The search was begun late Saturday, joined by more rangers and others Saturday night, and continued throughout Sunday. It was halted by darkness Sunday. By then more than 100 persons had joined in the hunt, including veteran rangers who had been going over the twisted trails and tangled underbrush for 28 hours. The search was resumed this morning.

Chief Ranger Lee Sneddon said the helicopters would also be used to carry searchers and equipment to the scene.

Vanishes in Wilderness

The father, an architect for Painter and Weeks, Knoxville, had started out Friday morning with his two sons, Dennis and Douglas, 9, and their grandfather, Clyde E. Martin, a Knoxville area school teacher. They camped Friday night at Russell Field on the edge of the Appalachian Trail and hiked Saturday to Spence Field, a large, almost level clearing at the 4800-foot level.

About 4 p.m. Saturday, as the two brothers played around a hikers' shelter they decided to sneak through the woods to the back of the shelter to surprise their father. They became separated in the thick growth and underbrush. Dennis vanished into the wilderness.

The father and grandfather searched for several hours before leaving the area to get help. Smoky Mountain rangers were alerted about 8 p.m. First reports to the park dispatcher said a boy was missing and the dispatcher said he did not know where the family was from.

A search was started, reinforced by more park rangers and others later.

...Awaits Word

The searchers slogged throughout the night in thunderstorms in the Spence Field area.

On Sunday, members of the Smoky Mountain Hiking Club, Sevier and Blount Country Rescue Squads, and Boy Scouts...
ESTIMATED MANHOURS AND COSTS - NATIONAL PARK SERVICE (thru 6/29/69)

MANHOURS

<table>
<thead>
<tr>
<th></th>
<th>Regular Hours</th>
<th>Overtime Hours</th>
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<tbody>
<tr>
<td>Classified (GSMNP)</td>
<td>2155</td>
<td>3527-1/2</td>
</tr>
<tr>
<td>Wageboard (GSMNP)</td>
<td>2164</td>
<td>3208</td>
</tr>
<tr>
<td>JCCC (GSMNP)</td>
<td>260</td>
<td>4071-1/2</td>
</tr>
<tr>
<td>Rangers (Other Areas)</td>
<td>760</td>
<td>938</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>5339</strong></td>
<td><strong>8081</strong></td>
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</table>

Grand Totals:

MANHOURS: 13,420
MANDAYS: 1,677-1/2

COSTS:

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<tbody>
<tr>
<td>Equipment and Supplies</td>
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<tr>
<td>Personal Services</td>
<td>$57,668.00</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$62,299.00</strong></td>
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TRANSPORTATION OF SEARCHERS TO SEARCH AREAS AND RETURN

HELICOPTER OPERATIONS

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<th>Hours</th>
<th>Passengers</th>
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<tr>
<td>Army</td>
<td>938</td>
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<tr>
<td>Air Force</td>
<td>78</td>
<td>22.6</td>
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<tr>
<td><strong>TOTALS</strong></td>
<td><strong>1,116</strong></td>
<td><strong>196.3</strong></td>
<td><strong>12,989</strong></td>
<td><strong>23,803</strong></td>
</tr>
</tbody>
</table>

@ $300/hr = $58,890

JEEP OPERATIONS

Total number of searchers taken to and returned from search area at Spence Field
---1800-2000 (estimate) ---

STATISTICS ON TENNESSEE ASSOCIATION OF RESCUE SQUADS INVOLVED

Total number of Squads participating - 57
Total manhours - 26,589 @ $6.00/hr. = $159,534.00
Total vehicle miles - 69,811 @ $.10/ml. = $6,981.00
Other Agencies Supplying Search Personnel - 17
Agencies Supplying Food and Medical Service - 8 (plus numerous unknown)
Agencies Supplying Transportation and Traffic Control - 7
Agencies Supplying Maps and Cartography - 3

MEDIA INVOLVED:

Television Stations - 6
Radio Stations - 10
Newspapers - 7

TOTAL COST OF THE OPERATION:

$159,534
6,981
58,890
62,299

$287,704 - TOTAL
CRITIQUE

1.0 There was no PREPLAN.

2.0 There was a delay in the First Notice.
   2.1 There were delays in making a lost person report to the authorities, and, there were delays by the authorities in responding.

3.0 Investigation was a marginal effort at best.

4.0 There should have been a higher Priority/Urgency assigned to the mission.

5.0 Initial Tactics.
   5.1 They did search at night, but vary superficially.
   5.2 There was no confinement or tracking strategies used. Dogs were not used until day 3. Searchers were not clue conscious, and the 240 searchers on day 2 probably destroyed most of the clues anyway. Grid searching was the primary search tactic emphasized and used.

6.0 The SAR Resources were simply assigned to the field as they arrived, without regard to expertise or capabilities.

7.0 Little or no planning occurred in relation to Establishing Probable Search Areas. The search centered around the point last seen, and expanded from there.

REMEMBER
Efficiency is doing things RIGHT
AND
Effectiveness is doing the RIGHT things RIGHT!
8.0 The Callout for resources was confused, and inadequate. Incomplete information was given resulting in untrained and physically unprepared, ill-equipped people arriving at the scene.

9.0 One of the biggest reasons for failure was the lack of Organization and Leadership.

9.1 There was almost no organization until day 5 when an overhead team began to emerge. On day 8 the numbers of people were not manageable.

10.0 There was never an organized Base Camp established.

11.0 Briefings and Debriefings were inadequate. There was not a formal strategy meeting held until day 5.

12.0 They were slow in starting Documentation. What currently exists is a shambles, with everything stored in boxes in an attic.

13.0 The external influences of the Relatives, Media, and Politicians became major problems.

13.1 The nationwide publicity, the inefficient media coordination, predictions by clairvoyants, the political involvements, and criminal possibilities all detracted from search planning efforts.

14.0 Evacuation plans were not considered until day 6.

15.0 There was no rational, systematic planning done toward Suspending the Mission.

16.0 Demobilization was not planned for, it just happened.

16.1 The same problems with masses of people arriving were all encountered when the people left.

17.0 There was little or no Post Mission follow-up.

18.0 Other deficiencies? List them:

Incidentally, no trace of Dennis Martin has ever been found.

- Kidnapped?
- Injured, then deceased, and animals ate remains?
- There were lots of rocks and crags that he could have fallen in.
- U.F.O.?
NOTES:

PRIORITY:

- TRAINING
- Search & Rescue
- Planning
- MITIGATION
- Volunteer Organizations
- Media
- Elected Officials
- Coordination
- Public Education
- Exercises
SEARCH AND RESCUE VULNERABILITY ASSESSMENT

OBJECTIVES: A student will be able to--

※ Complete a search and rescue vulnerability assessment for a local area or jurisdiction.

※ Describe the usefulness of a vulnerability assessment in the planning process.

※ Apply the concept of visual representation (risk mapping) to selling a SAR program and the SAR planning process.

1.0 WHAT IS A "SEARCH AND RESCUE VULNERABILITY ASSESSMENT" AND WHY IS IT IMPORTANT?

1.1 One of the most important tasks that must be accomplished before the SAR preplan can be created is an accurate assessment of the locations and types of SAR problems that might occur in your area. If done properly, this document will form the foundation for:

&mldr; Mitigative efforts to prevent the problems.

&mldr; Preplanning and training activities.

&mldr; Response SOPs and resource allocation.

&mldr; Rescue and recovery procedures and resource I.D.

1.2 A Search and Rescue Vulnerability Assessment is defined as a systematic investigation of potential search and/or rescue situations that may occur by analyzing:

☑ the history of the area.
☑ geographic factors.
☑ demographic information.
☑ probabilities.
☑ the availability of resources to solve potential problems.
1.3 Benefits of this assessment include:

a. Realistic preplanning for search and rescue.
b. Establishes both search and rescue resource needs.
c. Gives direction for PSAR and mitigative programs.
d. Provides incentive for local SAR response effort.
e. Enables local SAR coordinators to set priorities and goals that are commensurate with the local need.
f. Provides a tool to raise the level of understanding for key public officials who may control budgetary emphasis for SAR response.
g. Justifies management decisions for altering programming and staffing assignments.
h. Identifies potential trends and future needs for funding, resource allocation and training.

1.4 A well prepared SAR Vulnerability Assessment walks the narrow path between two diverse philosophies: "If something can happen, it will, so we have to be prepared for everything"; and "It can't happen here because it never has before!"

Man is basically the instrument of his own destruction because he has chosen to go where hazards exist in his pursuit of outdoor activities. Not only that, but he goes there entirely unprepared.

2.0 DEVELOPING YOUR VULNERABILITY ASSESSMENT

2.1 Identification of search and/or rescue mission types (Step 1).

a. This is the easiest of all the steps since it is simply the compilation of a list of all the mission types that are known to have occurred or that have the potential for occurrence. Most will be readily identifiable because of past history or recent missions, but some will be much more elusive. Some unique rescue situations may not be evident at the present time, but with increases in the area's use or population, they may become reality.

b. Consulting neighboring jurisdictions may also prove beneficial in this initial step.
2.2 Collection of Information (Step 2).

a. **Research is necessary** to gather all the information for the assessment. If possible, use all the agencies and organizations that might be involved in local SAR operations.

b. **Types of information to collect and compile:**

   (1) **Geographic Information**

   In order to show the physical impact of missions on logistics, communications, and operations in general it is necessary to identify the size of the jurisdiction, location in the state with respect to outside resources, climate, terrain features, environments to be dealt with, etc. This provides a basis upon which further information can be overlayed.

   (2) **Demographic Information**

   This information is vital in determining the potential risk that populations or outdoor users might encounter in the pursuit of certain activities. How many people go to these environments and what kinds of activities do they do. How many visitors does the local jurisdiction get every year from outside the area? How many missions can you expect from a certain number of outdoor users? In addition, other information about the local area may also be helpful. Examples:

   - number of senior citizen convalescent home walk-aways per year.
   - population fluctuations due to seasons, celebrations, holidays, etc.
   - future incentives for more outdoor users in the area.
   - mental health or other institution walk-aways per year (or at least population size).
   - unusual recreational attractions in the area.
(3) **Location of Activity (Visual Information)**

Every jurisdiction will have its own special mix of factors that should be described and analyzed in terms of vulnerability. As a final information gathering step in putting together your assessment, it is advisable to develop a comprehensive risk map which visually depicts the total mission potential for your area.

This accomplishes several important functions:

✔ Identifies potential high mission areas.
✔ Provides the basis for resource allocation and backup support.
✔ Identifies potential high activity seasons in specific geographic areas.
✔ Identifies the geographic need for public education and information.
✔ It is a useful tool for orienting and motivating executive policy makers.

Start with a plain map of the area. Reproduce the outline of your jurisdiction on numerous acetate sheets and attach them together so that they overlap each other exactly. Each overlay should depict a mission type and locations that these would be expected to occur. (This could be broken down as to time of year also.) The combination of all missions on the acetate is extremely impressive.

2.3 **Development of the SAR Vulnerability Assessment Report (Step 3).**

a. When the information has been gathered and analyzed, a report should be written and disseminated to the appropriate individuals.

b. We suggest the following format as a guide:

<table>
<thead>
<tr>
<th>I. Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>II. Geographic and Demographic Data</td>
</tr>
<tr>
<td>III. Potential Mission Information which should contain:</td>
</tr>
<tr>
<td>A. Mission description and general information.</td>
</tr>
<tr>
<td>B. Effects on existing local response resources.</td>
</tr>
<tr>
<td>C. History of these occurrences in the past.</td>
</tr>
<tr>
<td>D. Expected number of missions and potential shortfalls, both in terms of resources and money.</td>
</tr>
<tr>
<td>E. Conclusions of what needs to be done.</td>
</tr>
</tbody>
</table>

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SAR RESOURCES

OBJECTIVES: A student will be able to--

* Identify the basic types of search and rescue resources, and discuss their functions, limitations, and possible locations.

* Discuss the importance of identifying, evaluating and cataloging SAR Resources as an important part of the preplanning process.

"Meeting and Greeting all the resources in the preplan, while not a written requirement, is a fundamental task for the SAR Manager. A letter or phone call often substitutes for a personal visit. Knowing who the other person or group is, what it can do, and how it operates often means the difference between successfully putting these resources into play or not."

- Tim J. Setnicka, Wilderness Search and Rescue. 1980

1.0 LOCATED IN THE PREPLAN - Your SAR Resource list and locator is the "heart" of your preplan. The directory of SAR Resources must be "manufactured" by you and will be a changing document.

1.1 SAR resources can be categorized in a variety of different ways, such as:

a. By the types of strategy or tactic capabilities of the unit, or unit members. (SEE INVENTORY SYSTEM AT END OF THIS CHAPTER)

b. By the types of SAR environment, and the special techniques needed for each, such as:

* Air search.
* Water/river search.
* Technical rock.
* Snow/ice.
* Restricted land search.
* Open land.
* Desert search.
* Specialized search - cave.
c. **List human resources by:**
   - Name.
   - Phone numbers.
   - Experience or capability.
   - Availability.

d. **List resources by generic type,** i.e., aircraft, dogs, scuba, mountain rescue, etc.

1.2 Refer to the "Format for Listing SAR Resources" by Jon Gunson in this chapter.

---

**2.0 RESOURCE EVALUATION** - You must ask **six basic questions** to evaluate a resource's usefulness for a given mission:

2.1 **Availability**

   a. Are they ready to respond?
   b. Are there any special requesting procedures or conditions?

2.2 **Response time after notification**

   a. A measured response?
   b. An emergency response? (It is important to remember that search area size is time dependent).
   c. Are the resources on hand or immediately available? If not, what is the time lag?

2.3 **Capabilities**

   a. Can the resource really perform the task quickly, safely, efficiently?

2.4 **Limitations**

   a. Are they in "shape" mentally, physically?
   b. How proficient or effective is the resource?
   c. Special considerations - language, radios?
   d. Competition - ego?
   e. Will they work with and for you?
   f. Special considerations - communications?

2.5 **Qualifications**

   a. Is the resource really qualified as shown by training, past performance and work record?

2.6 **Back-Up Resources**

   a. A good plan necessitates considering more than one resource source.
3.0 Every source of manpower, equipment and supplies that could be used in SAR should be considered in preparing a Resource List.

3.1 Resources can be broken down and organized in a variety of ways.

First consider these two divisions:

a. Human Resources:
   - People with a variety of skills and knowledge.
   - Can be organized to form a major resource.

b. Physical Resources:
   - Material items.
   - Specialized equipment.
   - Specific facilities.

3.2 Another division of resources might well be determined by the resource’s primary mission:

a. Dedicated emergency - those that respond or are used just for emergency conditions. (e.g., air ambulance, MAST helicopter, etc.)

b. Non-emergency - those that provide valuable services, aid or capabilities not associated with emergency response. (e.g., lighting equipment, logging company assets, etc.)

3.3 Yet another set of categories can be established to define a resource’s location:

a. Public sector - those owned and controlled by the government at local, state and federal levels.

b. Private sector - those provided by business or industry. (e.g., snow machines, transportation vehicles, etc.)

c. Volunteer sector - those provided by volunteer groups including food, shelter, equipment and communications. Also known as "Non-Paid Professionals!"

3.4 In terms of availability, resources that are dedicated emergency from the public sector are available first and fastest. Those that are volunteer, non dedicated emergency comprise the least available.
3.5 If considering **strategy and tactics**, it may be useful to consider some **additional categories** as well.

a. **Initial attack** - quick responders that can be committed immediately.

b. **Backup resources** - slower responding because of distance but reliable for shift change and support functions.

c. **Specialized resources** - very technical or specialized skills for specific tasks. (e.g., divers, satellite communications, etc.)

d. **Logistical, supply or maintenance resources** - to keep other resources going in the field.

e. **Informational.**

4.0 **SOME COMMONLY USED SEARCH RESOURCES**

4.1 **Aircraft**

a. **Helicopters** - useful for movement of supplies and equipment, search area evaluation (planning) and for actual searching in certain terrain and vegetation.

✓ **Limitations** (depending on aircraft type):

1) Refueling.
2) Elevation.
3) Searching effectiveness.
4) Weather.
5) Known hazards.

✓ **Sources:**

1) Military - primarily through the Rescue Coordination Center or local base.
2) Government contract.
3) Private.
b. **Fixed wing** - useful for search area evaluation and for actual searching in certain terrain and vegetation.

**Limitations:**

1) Searching effectiveness.
2) Accessibility to search area (landing strips).
3) Weather.

**Sources:**

1) Military - primarily through Rescue Coordination Center or local base.
2) Civil Air Patrol - through RCC or local CAP unit.
3) Government contract.
4) Private.

### 4.2 Dogs

a. **Tracking/trailing** - search by following actual route taken by subject from a last known position. Scent-article generates search.

**Advantages:**

1) Can effectively discriminate lost subject from other persons if good scent article is available.
2) Highly efficient (probability of detection per hour of effort).

**Limitations:**

1) Less effective after other searchers or weather have contaminated or destroyed scent clues.

**Sources:**

1) Local law enforcement departments.
2) Volunteer units.
3) RCC.
b. **Airscenting** - search "off lead" by locating human scent borne by air currents.

**Advantages:**

1) Can search large areas efficiently.
2) Can be used after "airing out" a contaminated search area.

**Sources:**

1) Volunteer units.
2) RCC.
3) Local Law Enforcement Departments.

**NOTE:** Search dogs are a highly efficient resource and are most effective as first responders. They have been successfully trained to locate subjects and clues buried in snow, rubble or submerged in water.

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**A comprehensive directory of SAR dog units in the U.S. is available through the National Association for Search and Rescue.**

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4.3 **Human trackers** - follow the route taken by lost subject from a last known position (LKP) by locating tracks and "route disturbances" left by subject.

**Advantages:**

1) Highly efficient if good LKP exists.
2) Can "eliminate" large portions of search area.

**Limitations:**

1) Less effective after clues have been destroyed.

**Sources:**

1) Volunteer units.
2) U.S. Border Patrol.
3) Local Law Enforcement Departments.
4.4 Trained Searchers

a. Hasty teams - small, highly mobile, clue conscious teams.

✓ Advantages:

1) Can quickly check "high probability" locations, hazard areas, etc.
2) Can locate clues for use in search area establishment.
3) Usually familiar with search area environment.

✓ Sources:

1) Local agency or volunteer units.

b. "Grid teams" - organized, thorough units.

✓ Advantages:

1) Can provide thorough searching.

✓ Limitations:

1) Destroy clues.
2) Very low efficiency (probability of detection per effort expended) - should be used as last resort.

✓ Sources:

1) Local units, such as rescue squads, Explorer SAR units, other agency or volunteer units.

4.5 Special Competence Resources

a. Rough terrain responders - characterized by units with skills and special equipment to operate effectively in mountainous, hilly or very remote environments.

✓ Sources:

1) Specially trained units in the local area such as Mountain Rescue Association Units, rescue squads, etc.

b. Water responders - units or individuals with skills and equipment to search, rescue or recover in surf, swift water or deep water environments.

✓ Sources:

1) Local units or individuals from rescue squads, sheriff's dive-rescue units, or organized divers organizations (e.g. Diver's Alert Network, National Association of Underwater Instructors, SCUBA Clubs, etc.)
c. Winter environment responders - units with skills and equipment to search for or rescue in snow, ice, avalanches, etc.

✓ Sources:

1) Local units or individuals such as members of National Ski Patrol, Ski area pro-patrol, Mountain Rescue Association Units, etc.

d. Specialized vehicle responders - local units or individuals with vehicles capable of responding in special terrain/environmental conditions; such as:

- oversnow vehicles.
- four-wheel drive vehicles.
- all-terrain vehicles.
- mountain bikes.

e. Subterranean responders (cavers)- units with skills and equipment to search for or rescue in caves, caverns and mines, etc.

✓ Sources:

1) Local units or individuals such as members of National Cave Rescue Commission or National Speleological Society, the Mine Safety and Health Administration, and the Office of Surface Mining.

f. Horse responders - units or individuals with riding or pack animals and skilled handlers for searching remote or rough terrain or for transporting supplies or equipment.

✓ Sources:

1) Sheriff's posse's or auxillary units.
2) Equestrian units.
3) Local "dude ranches", guides, etc.
5.0 IMPORTANT MANAGEMENT AND SUPPORT RESOURCES

5.1 Search Management Team - The specific functions required to effectively manage a search mission often require highly trained individuals. In particular, on searches, the following functions should be staffed by specialists:

- Search Manager.
- Plans Chief.
- Operations Chief.
- Logistics Chief.
- Investigation Unit Leader.
- Communications Unit Leader.
- External Influences Officer.

Sources of these specialists should be preplanned, in the same way that tactical resources are, because they are not always available within the immediate area or jurisdiction.

5.2 Logistical Support - Food and shelter can often be provided by civic organizations, American Red Cross, Salvation Army, Church groups, Auxiliaries (e.g., USCG Aux.), Military, and private vendors.

5.3 Weather Information - Flight Service Stations, Air Traffic Control Centers, radio and T.V. news, F.A.A. centers, and military bases all can provide weather information especially if you have a local office "Upstream" to check on current as well as predicted weather.

5.4 Communications Support - In addition to the internal communications systems of responsible and support agencies and organizations, additional and specialized communication support is often available from:

- REACT units.
- CB clubs.
- HAM operators.

5.5 Facility Equipment - The preplan must identify sources for the following types of special equipment needed to help manage and support the mission:

- Extra telephones and lines.
- Computer equipment.
- Photocopy equipment.
- Transportation (buses, etc.).
- Sanitation Facilities (dumpsters and portable toilets).
- Temporary shelter (small circus tents, funeral canopies, etc.).
- Portable heaters.
6.0 SPECIAL RESOURCES

6.1 Every search and rescue mission involves special resources of some kind. Generally speaking, special resources in the SAR community refer to those resources which are called upon to solve unique or highly specialized problems. For the most part they are used quite infrequently in general SAR activities. They are often used as a last ditch effort or a time critical maneuver, in conjunction with regular search resources.

**Regular SAR resources might include:**

- Explorer Search and Rescue
- Mountain Rescue.
- 4 X 4 Rescue Units.
- Civil Air Patrol.
- Snowmobile Rescue Teams.
- Ski Patrol Rescue Teams.
- Hasty Teams (Professional and Volunteer).
- Communications.

**Special SAR resources might include:**

- Attraction devices.
- Interrogators.
- Mine Detectors.
- Noise Sensitive Equipment.
- Prophets, Diviners and Seers.
- Photo - Interpretation
- Sniffers - (Mechanical).
- Trackers.
- Thermister Detectors.
- Witchers.

6.2 Among the **special resources that might be useful are:**

**a. Attraction Devices:** - Generally discussed in the passive mode of search under Tactics:

- Lights.
- Sirens.
- Horns.
- Flags or ground signals.
- Lines, ropes, strings or tags.
- Signs.
- Gun shots or flares.
- Loud speakers with a PA system.
- Balloons.
- Search Lights.
- Strobe Lights.
b. **Interviewers:** - Can be considered special but is most likely a very important regular resource skill which a SAR Manager might use.

  - *An interviewer is an expert in questioning.*

  a. Different types of questions will produce different information.
  b. All witnesses and casual observers must be questioned.
  c. Never assume anything.
  d. An interviewer will go from the general to the more specific.
  e. They must be relentless.

  - *Good interviewing will yield both planning and searching information.*

  c. **Magnitometers:** - Works on deviations in earth's magnetic lines:

    - Primarily used in avalanche work.
    - Locates rocks or pieces of metal in the area.

  d. **Mine Detectors:** - An obvious military resource:

    - Not readily available.
    - Sensitive to medium density.
    - Not metal.
    - Primary use would be in avalanche search and rescue.

e. **Noise Sensitive Equipment:** - Another military resource:

    - Usually not practical.
    - Has been used in the past with not much success.
    - Primary problem is that most outdoor areas are very noisy anyway.

f. **Prophets, Diviners and Seers:** - On the average, their success is about 3% above pure chance:

    - A major search will generally always bring out these types of people.
    - Watch out for those that want to charge a fee.
    - They should be taken seriously because millions of people believe in them and a percentage could be genuine.
    - Should be handled by the search director or his aide.
    - Even if you believe the person to be a charlatan, they deserve consideration because of appeasement to the family and loved ones of the victim.
    - They should not be let into the field alone, or without some qualified escort.
    - Consider them into the overall search strategy.
g. **Photo - Interpretation:** - Fairly good resource except that a qualified person is needed to analyze the photos.

- **Simple black and white aerial photos could yield the following:**
  a. Tracks.
  b. Signals.
  c. Evidence of any kind (wreckage, litter, etc.).

- **Infra red photos are heat sensing:**
  a. They detect warm bodies or warmth of any kind:
    (1) Animals.
    (2) Springs.
    (3) Campfires.
  b. There are interpretation problems.
  c. There is also a map transfer problem for the search coordinator.

- **Camouflage penetrating photos:**
  a. Detects man-made metal structures.
  b. Again there are interpretation problems.

h. **Sniffers: - Mechanical:**

- Primarily a military resource.
- They are sensitive to odors.
- Their application is good for finding bodies in disaster type incidents.

i. **Thermistor:** - A device which is sensitive to the changes in temperature of the medium below:

- Primary use is in avalanche search.
- A military resource.

j. **Witchers:** - Approximately 15% effective on the average.

- Somewhat different than prophets, diviners and seers.
- Good in avalanche search.
- Have been used for missing children with some success.

k. **Crisis Intervention Specialists.**

l. **Grief Reaction Specialists.**

m. **Seismic Equipment.**

n. **Remote TV Equipment.**
## A Format for Listing SAR Resources

**Jon Gunson: Summit County Rescue Group, Colorado**

**List of Resources:** You should complete an inventory of all the various resources which are available to you both locally and out of the area. This list should be comprehensive, accurate and regularly updated.

**Resource Types:** Some resources such as helicopters can be very useful with a number of different capabilities in the search operation. Most of your search resources, however, can be cataloged in one of the following general types. You should make certain that your requirements for a search can be satisfied in each of the following areas.

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Tactics</th>
<th>Method</th>
<th>Name of Resource</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Management</td>
<td><strong>Planning</strong></td>
<td>Local staff trained volunteer, overhead team</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Logistics</strong></td>
<td>Local staff trained volunteer, overhead team</td>
<td></td>
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<td></td>
<td><strong>Investigation</strong></td>
<td>Local staff law enforcement trained volunteer, overhead team</td>
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<td></td>
<td><strong>A. Management cont.</strong></td>
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<tr>
<td></td>
<td><strong>Liaison</strong></td>
<td>Local staff</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>Communications</strong></td>
<td>Local staff trained volunteer</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>Support</strong></td>
<td>Local staff trained volunteer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Confinement</td>
<td><strong>Road blocks</strong></td>
<td>Law enforcement</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>Road patrols</strong></td>
<td>Two wheel vehicles, Four wheel vehicles</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>Trail blocks</strong></td>
<td>Law enforcement, volunteers, climbing club, unplanned manpower</td>
<td></td>
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<tr>
<td></td>
<td><strong>B. Confinement cont.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Trail patrols</strong></td>
<td>Hikers, horse, motorbikes, skiers, snowmobiles, all-terrain vehicles, dune buggies</td>
<td></td>
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<tr>
<td></td>
<td><strong>Look outs</strong></td>
<td>Volunteers, untrained manpower</td>
<td></td>
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<tr>
<td></td>
<td><strong>String lines</strong></td>
<td>Trained manpower</td>
<td></td>
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<tr>
<td></td>
<td><strong>Camp-ins</strong></td>
<td>Local volunteers</td>
<td></td>
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<tr>
<td>C. Attractions</td>
<td><strong>Sight</strong></td>
<td>Fire, smoke, search lights, aircraft, weather balloons</td>
<td></td>
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<tr>
<td></td>
<td><strong>Sound</strong></td>
<td>Sirens, fog horn, guns, power megaphone, aircraft</td>
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</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Strategy</th>
<th>Tactics</th>
<th>Method</th>
<th>Name of Resource</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>D. Clue finding</td>
<td>Interrogation</td>
<td>Law enforcement trained volunteers</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Visual tracking</td>
<td>Trained volunteers</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Tracking dogs</td>
<td>Trained volunteers</td>
<td></td>
<td></td>
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<tr>
<td>E. Clue/Subject finding</td>
<td>Scratch search</td>
<td>Trained volunteers</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Sign cutting</td>
<td>Trained volunteers</td>
<td></td>
<td></td>
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<tr>
<td>F. Subject finding</td>
<td>Team search</td>
<td>Trained teams</td>
<td></td>
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<tr>
<td></td>
<td>Line search</td>
<td>Trained teams</td>
<td></td>
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<tr>
<td></td>
<td>Water search</td>
<td>Boats, kayakers, rubber rafts, divers</td>
<td></td>
<td></td>
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<tr>
<td>F. Subject finding cont.</td>
<td>Special hazard search</td>
<td>Winter/mountaineers avalanche teams, cavers, mine experts, rock climbers</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Air search</td>
<td>Helicopter, fixed wing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G. Communication</td>
<td>Radio</td>
<td>VHF, UHF, CB, amateur relays</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Landline</td>
<td>Public phone, radio, telephone, field phones, teletype, watts, FTS, autovon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H. Transportation</td>
<td>Land</td>
<td>Bus, truck, second vehicle, four wheel vehicle, snowmobile, snowcat, all terrain vehicles</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Air</td>
<td>Helicopter, fixed wing</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Water</td>
<td>Boats</td>
<td></td>
<td></td>
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<tr>
<td>I. Support</td>
<td>Pool/water</td>
<td>Volunteers, Salvation Army, Red Cross, field kitchen, catering service</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Shelter</td>
<td>Volunteers, Red Cross, Civil Defense</td>
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<tr>
<td></td>
<td>Medical</td>
<td>First-aid, EMT, nurse, paramedic, doctor</td>
<td></td>
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</tr>
<tr>
<td>Strategy</td>
<td>Tactics</td>
<td>Method</td>
<td>Name of Resource</td>
<td>Phone</td>
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<tr>
<td>I. Support cont.</td>
<td>Sanitary</td>
<td>Port-a-potty, field latrine</td>
<td></td>
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</tr>
<tr>
<td>J. Rescue and Recovery</td>
<td>Non-Technical</td>
<td>Litter teams, 4 wheel, snowmobile, helicopter, ambulance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Technical</td>
<td>Teams of: Rock rescue, mine rescue, cave rescue, avalanche rescue: helicopter, underwater recovery teams.</td>
<td></td>
<td></td>
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<tr>
<td>K. Other</td>
<td></td>
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</table>

**ORGANIZED RESPONDERS (VOLUNTEER)**
THE SEARCH & RESCUE PREPLAN IS OPERATIONAL

• Who
• What
• Where
• When
• How
PREPLANNING - THE DEVELOPMENT OF AN OPERATIONAL PREPLAN

OBJECTIVES: A student will be able to --

※ Discuss the Relevance, Benefits, and Steps in Preparation of a SAR Preplan.

※ Describe the Importance of Preplanning to the Success of a Search Mission.

※ List the Elements of a Preplan.

※ Develop a Preplan.

1.0 WHAT IS THE OPERATIONAL PREPLAN?

1.1 There are a number of guidelines, policies, "how to" documents, etc., to consider in developing a preplan. The materials for this course are a "how to" document and should not be considered an operational preplan themselves.

1.2 Generally, there are three categories of planning documents, as they pertain to SAR:

(1) Management Documents - This includes all those references that contain policies, authorities, responsibilities, legal constraints and requirements. These form the umbrella under which the operational preplan is prepared.

(2) "How To" Manuals - Resource documents and texts that provide explicit instructions such as what to carry, how to run search patterns, how to tie a certain knot, etc. These are the references that your resources use to become proficient in certain skills or abilities so that they are valuable resources. All you need to know is that they know how to do it. Your job is to see that the right resources are available and assigned to tasks they are trained to accomplish.

(3) The Operational Preplan - When the mission actually breaks, this is the document that is the most important. Management constraints must already have been well entrenched in the minds of those responsible for the mission. The skills professed by the "How To" manuals must already be well learned and rehearsed by those who must use them.

The operational preplan is the working document that provides key personnel with ongoing information, guidelines and technical data during the actual conduct of the mission.
2.0 WHY PLAN FOR SEARCH AND RESCUE?

2.1 To Be Effective - Planning is done so that lives may be saved. During SAR operations, correct decisions must be made and many decisions can be made prior to the mission. Plans are future decisions.

2.2 To be efficient and economical - We are always aware of the need to control the expenditure of funds and manpower. In a search, time is critical and cannot be wasted. We need to carry out the mission with the least expenditure of money, human resources, and TIME.

2.3 TO SAVE LIVES!

NOTE: "In crises that force people to choose among alternative courses of action, most people will choose the worst one possible."

2.4 To prevent this, we need to develop preplans, SOPs, and checklists.

'SAR preparedness and preplanning involve more than fancy paraphernalia and a notebook of telephone numbers. . . . The preplan is an operational guide that, if designed and implemented correctly, will help introduce order to the chaos and furor accompanying the initial notification for help."

- Tim J. Setnicka, Wilderness Search and Rescue, 1980

3.0 PREPLANNING IS AN IMPORTANT FUNCTION OF MANAGEMENT

3.1 Usually it is one of the least developed aspects of SAR management.

3.2 Planning is concerned with two major elements:

- The future.
- Achieving an end result, and includes the "how to".

3.3 Plans are future decisions, usually broad.
4.0 **BENEFITS OF A PREPLAN**

1. Identifies all the resources that conceivably could be needed.

2. Describes the capabilities of all resources.

3. Eliminates inefficiency.

4. Recognizes hazards (potential problems).

5. Mitigates hazards where possible.

6. Takes advantage of resources (prior agreements, funding, etc.).

7. Ensures proper mobilization and deployment of resources.

8. Oriented and guides new personnel.

9. Allows for change.

10. Creates a review process (mission critique, annual update).

11. Prevents overlooking something.


13. Establishes a means to gather and disseminate information.


15. Assigns tasks.

16. Establishes the chain of command and organization.

17. Creates possibilities for training and practice.

18. Identifies training needs.

19. Provides for common terminology so that everyone is talking the same language.

20. Other?

5.0 **SOME OTHER THOUGHTS:**

5.1 **A Preplan is a management tool.** It provides information, guidelines, and technical data during a mission.

5.2 A Preplan should be **complete, simple, adaptable** and should **define authorities**.

5.3 The **key** to making a plan work is the ability to vividly paint clear **mental images** of the plan in the minds of the people who have to know.
5.4 The Preplan is the blueprint from which all response to SAR situations is established.
   - All key leaders must be familiar with its contents.

5.5 Clearly establish legal responsibilities and jurisdictions.
   - Know your neighbors.
   - Federal and state SAR plans.
   - Local organizations and responsibilities.

5.6 Agreements:
   - Should be in writing.
   - Should answer who is in charge?
   - Who can assist?
   - Describe money/liability arrangements.
   - Who will handle the media?
   - How to work together (training)
   - Review by legal counsel.

5.7 Plan format:
   a. Pleasing to the eye, easy to read.
   b. Use - spaces
      - boxes
      - lines
      - italics
      - artwork
   c. Emphasize important points.
   d. Easily updated and revised.

5.8 Keep the document simple:
   - Use only what is necessary.
   - No duplication of other documents, reference instead.
   - Short, simple explanations.
   - As the plan writer, put yourself in the place of the intended user.

5.9 Keep the plan flexible.
   - Continually review and update.
   - Applicable to all situations.
   - Easily adapted - wording not emergency specific.
   - Use few specific names.
   - Flexible, But not limp!
6.0 MAJOR INFLUENCES TO BE CONSIDERED WHILE DEVELOPING AN OPERATIONAL PREPLAN

6.1 The following are some of the things that must be considered in the actual preparation of an operational Preplan. Normally, one person will not have all the critical information necessary to make a Preplan an optimum one. Input from all appropriate sources should be solicited.

YOU SHOULD NEVER PLAN ALONE

The following list is not in any order of importance:


b. Potential Problems (Risk Analysis) - Just because it has not happened, does not mean it can't or won't. Consider all reasonable possibilities and how they would be responded to. If it is reasonable that you might have to mount a mission for the lost pilot of a U.F.O., include it! But, seriously, be reasonable. To include every remote possibility will unnecessarily make the Preplan more complex and less likely to be used. Types of missions that occur frequently might also be carried out effectively without the use of a Preplan because of actual experience and practice.

It is those kinds of missions that occur infrequently or have never before occurred that cause indecision, poor response, and mismanagement -- things easily overcome by a good Preplan.

c. The Area - Consider all aspects and influences, to include; terrain, weather, hazards, attractions, facilities, etc.

d. The Management Constraints - Nothing in the operational Preplan should conflict with legal constraints, authorities, policies, etc. The Preplan refers to these constraints and supplements them with operational details. It provides for the implementation of them.

e. External Influences - Landowner, cooperating agencies, politics, the media, etc.

f. The Organization - Internal chain of command, personnel capabilities, etc.
g. **Emergent Conditions** - This may be more important to consider than anything else. It is based on past experience and observations. All of the management constraints, past Preplans, organizational structure, etc., dictates ways things should be done. But when the mission breaks, chances are things actually happen somewhat differently. It is one thing to plan things considering the IDEAL. But to be really useful, this document must consider REALITY. It must strive to overcome those things that actually happen that are undesirable and build on those things that actually happen that contribute to effectiveness and efficiency.

h. **Consider:**

-- Consider all "what ifs"!
-- What is the actual chain of command in emergencies?
-- What informal communications links emerge?
-- Who really takes control; who really makes decisions?
-- How fast do resources actually respond; are they really as capable as they say?

6.2 The operational Preplan does not necessarily address each of these above listed influences directly. In other words, the Preplan would be made more cumbersome by including an extensive history of missions, or repeating the management constraints. These influences, collectively provide the parameters and determine the ingredients for the Preplan.

6.3 **PLANNING ESTABLISHES:**

- Policies
- Procedures
- Programs

But it needs CONTROL! Compare actual activity with the Pre-determined plans. If the plan is not working, then modify it or write a new one.

"A good plan today is better than a perfect plan tomorrow"

7.0 **FUNCTIONAL CHARACTERISTICS OF A GOOD PREPLAN**

7.1 **Format** - If your agency uses a prescribed format, you will use it, of course. But that does not mean you are stuck with a bad product. The quality of an operational Preplan is largely independent of its format. Format is merely convenience and style and content can be adapted to any format. One serious consideration, though, is that the format should allow for easy updating and revision. (See 7.3)
7.2 **Simplicity** - Unless you are required to do so, to duplicate detailed information from other documents (See Part 1.2) is unnecessary, a waste of time, and complicates the document. Put yourself in the place of the user.

If the Preplan gets stuck away in a drawer, and is rarely, if ever, referred to - even during a mission - then it is not worth the time it took to prepare it.

The Preplan has to be the "brain" for the structure of the "SAR Critter:" The skeleton, muscles and vital organs are made up of other components.

7.3 **Flexibility** - To be effective, a Preplan must be constantly reviewed and updated. Influencing conditions change, so the Preplan must be regularly and frequently evaluated and revised as appropriate. It must be evaluated during an "ongoing" mission and critiqued in detail immediately after each mission.

It is very useful to distribute an operational Preplan in a thin 3-ring binder. This allows substitution of individually revised, updated or added pages without redoing the entire plan.

Follow your plans, however you must still remain flexible without going limp!

Example: As leader of the band, keep everything in perspective. If the tuba player is sick, send in a jug player.

7.4 **Combination Operational Preplan**? Should an operational Preplan be a combination to include all emergencies (search, rescue, disaster), or should each of these types of emergencies have separate Preplans? There is no one answer to this. It depends on many factors, including:

-- Responsibility and authority for each.
-- How closely related the types of missions are in the area.
-- Frequency of each.
-- Complexity of each.

It may be best to start out with separate plans and then combine as appropriate.
8.0 OPERATIONAL PREPLAN DETAILS

8.1 The following list of components to be included in the operational Preplan is a checklist only - to serve as a reminder so that nothing is omitted. Their order and specific elaboration of each depends on existing circumstances. This list pertains primarily to search missions.

**Purpose and Objectives of the Preplan** - As appropriate.

**Priority of Mission** - How does this type of emergency "stack up" against others, in terms of priority of effort.

**First Notice** - Notification procedures.

**Relative Urgency Guidelines** - Considering terrain, subject, weather, other relevant factors.

**Investigation Procedures** - Specific agency guidelines and other considerations.

**Strategy** - Considerations for defining the scope of the problem and determining a course of action.

**Tactics** - Specific considerations regarding the methods and actions to be carried out to find a lost person, rescue someone that is injured, etc.

**Priorities for Resource Allocation** - Determines the order in which available resources will be allocated to the mission.

**Emergent Authorities and Responsibilities** - Specific conditions that dictate changes, i.e., scope of mission crossing jurisdiction boundaries, increasing complexity, etc.

**Callout Procedures** - Procedures for calling out resources and specific information that is to be provided to them.

**Functional Organization** - Management structure for the mission, functions to be fulfilled, etc. It is best to list functions only in the body of plan - and personnel assignments to the functions in an appendix.

**Base Camp Considerations** - Preplan locations for and actual layouts for base camps.

**Clues** - Record-keeping procedures, etc.

**Technical Communications** - Procedures internally and externally, frequencies, methods, etc.
**Briefing and Debriefing Procedures** - Specific forms could be included in an appendix.

**Medical Considerations** - Procedures for dealing with injuries.

**Fatalities** - Procedures should provide for the possibility of criminal involvement; coroner responsibilities.

**Rescue/Evacuation Considerations** - Special rescue problems should be considered.

**Mission Suspension/De-escalation** - How will the determination be made to suspend, lists of possible criteria.

**Demobilization Procedures** - Procedures to recall personnel from the field, and "head them home."

**Documentation/Reporting Requirements** - Appropriate forms should be attached as appendices.

**Critique Procedures** - Procedures for constructively reviewing the mission.

**Special Problems** - Depending on circumstances, many other considerations may necessarily be included, such as:

- Restricting airspace.
- Aircraft crash considerations; private, commercial and military.
- Safeguarding victim valuables.
- Resource protection.
- Cost accounting procedures.
- Manifesting, timekeeping, etc.
- Prevention actions.
- Dealing with subject's relatives.
- Physical fitness considerations for SAR Team members.
- Press briefings and media spokesperson identification.

**APPENDICES** -- The following should be included in the operational Preplan as appendices; they can be referred to individually and are easily revised:

- Resource lists.
- Phone lists.
- Equipment lists.
- Organizational chart (with names).
- Cooperative agreements.
- Forms.
9.0 THE SAR PLANNING PROCESS

The process of developing local pre-plans is often more valuable than the plan itself. The process should enable individuals and organizations to examine their roles and responsibilities in relation to everyone else and the response system as a whole. If done properly, it also, will keep SAR and its associated issues/programs higher on the local priority list.

1. Define the hazards and potential problems (both search related and rescue related); include all historical occurrences.

2. Establish who is going to respond, and with what.

3. Obtain chief law enforcement officer support. (or legislatively mandated responsible agency executive).

4. Talk to your resources on a first visit (meet and greet).

5. Draft the basic plan and SOPs.

6. Make a second visit to obtain comments on draft plan, clarify responsibilities, and eliminate duplication or conflicts.

7. Conduct a training mission.

8. Critique the training mission, with the goal to improve the plan.

9. Finalize the basic plan, based on critique comments.

10. Maintain the plan and process.

10.0 ELEMENTS, OUTLINE FOR A SAR PREPLAN

10.1 Knowledge of the environment.

- Documents to include maps.
- Identify high danger areas, hazards.
- Identify points of attraction.
- Show roads and trails.

10.2 Inventory of resources.

a. Human Resources.

- What people are available?
- Qualifications?
- Response time?
- Where and to whom do they report?
b. Physical Resources.
   - What is available?
   - Who to contact?
   - Response time?
   - Limitations?

c. Informational Resources.

d. Special Resources.

10.3 Method for collection of information on missing subject(s).
   - First notice procedures.
   - Planning, searching data.
   - Lost person questionnaire.
   - Investigation procedures.

10.4 Method for collection and analysis of data from incidents.
   - Case histories.
   - Lost person behavior.

10.5 Development of an action plan, includes procedures for:
   - Establishing priority, urgency.
   - Investigation.
   - Initial response (callout).
   - Step-up plan (increasing size of response).
   - Establishing base camp.
   - Establishing an organization (overhead team).
   - Monitoring, planning mission progress (POA x POD = POS).
   - Providing logistical support.
   - Dealing with the media.
   - Communications.
   - Evacuation, rescue plan.
   - When, how to suspend.
   - Demobilization plan.

10.6 Post mission activities.
   - Critique of the operation.
   - After-action paperwork.
   - Change, update plan, procedures.

10.7 Method for prevention of future incidents.
   - Preventive SAR (PSAR) education.

The key to making a Plan work is the ability of the plan to vividly paint clear mental images of the plan to the people who have to know and who have to act.
11.0 SUMMARY

11.1 It is a standard rule that two hours of planning should be done for every one hour of performing the activity being planned. It is a sad fact that this is nowhere near the case with search preplanning. Too often, if an operational Preplan is done at all, it is done because "it's the thing to do," or because it is required by higher authority. As such, it rarely really serves as a true operational plan but rather as an administrative requirement.

11.2 A good operational Preplan is not a problem solving document, but rather a problem avoiding document.

11.3 A real difference can be made with a good Preplan - if it is done with the objective of improving effectiveness and reducing inefficiency. And if, after being prepared, it is used, reviewed, and evaluated constantly, rather than being stuck away in a drawer where no one remembers where it is when a mission breaks.

If good planning takes place the results will be a substantial savings of time, effort and cost on mission - and time is life in this business!

VITAL PLANNING QUESTIONS

1) What do you want to have when the plan is concluded?

ANSWER: Successful SAR Missions.

2) What will we have to do to make the plan become reality?

ANSWER: Follow it! Use proper resources and techniques!

3) What might happen or go wrong to spoil the plan?

ANSWER: Anticipate problems, be flexible!

4) What will we have to do to make sure that we do not suffer embarrassment through inefficiency?

ANSWER: Rehearse! Train! Hold briefings and debriefings! Critique! Follow the Plan! Develop S.O.P.'s!
PLANNING DATA/SEARCHING DATA

OBJECTIVES: A student will be able to--

* Discuss how the processes of Pre-Planning, First Notice, Investigation, and Interviewing should produce the necessary Planning Data and Searching Data needed to ensure that the search effort is minimized and successful.

* Identify the minimum information that is needed to construct a search plan.

The gathering of planning (strategy) data is an ongoing, investigative, clue-seeking process. You need to quickly establish that you have a valid mission before you can commit searchers to the field.

1.0 INTRODUCTION

1.1 Remember, search theory dictates that we look for clues, and not the subject. The purpose of this chapter is to establish the necessary categories of information that must be obtained so that the "classic mystery" can be solved. This information is vital so that facts about the lost subject can be matched with clues.

1.2 Unfortunately, we usually begin a search effort with limited information. Initial first notice calls are often brief, and the initial information is usually incomplete.

1.3 It is important to begin a subject profile (Lost Person Questionnaire) at the time of the first notice and to keep it current through an ongoing investigation.

2.0 PLANNING DATA: Information required for adequate search planning strategy.

2.1 Category of the Subject: (hiker, hunter, child, elderly, etc.).

Subject information will provide clues and other behavior generalities to help determine:

a. the detectability of the subject.
b. potential travel aids used by the subject.
c. the possible total distance traveled by the subject.
d. the potential for the subject's survivability (includes clothing, equipment and experience).
Example, consider a hunter versus a hiker:

- **Detectability**: Hunters usually wear bright clothing, while hikers tend to wear "earthy" colors that blend in with the environment.
- **Travel aids**: Hunters travel cross-country or follow game trails, while hikers normally travel on defined trail systems.
- **Distance traveled**: Hikers on trail systems can travel further than hunters that are "beating the brush."
- **Survivability**: A hiker with a full backpack with all necessary equipment and clothing for extended backcountry living would have a higher potential for survival than hunters who may carry little more than the clothes they are wearing.

2.2 **Point Last Seen (PLS), or Last Known Position (LKP).**

   a. Be as accurate as possible because the PLS or LKP is:

      - the base point for the average distances (or potential distances) traveled by the subject, depending upon the category.
      - a starting point to begin surveying the area for clues.

   b. Determine exactly where and when did any initial responders look. Any clues detected?

   *Important, obtain names, addresses, and phone numbers for all family, friends, or witnesses.*

2.3 **Circumstance of Loss.** Pay attention to detail.

   a. **Exactly, when and where** was the subject missing? Possibilities include:

      - missing from a known location?
      - missing en route?
      - missing in wilderness (off trail)?

   b. **Exactly, how long** has the subject been overdue?

   c. Have witnesses verbally replay the exact sequence of events.

2.4 **Subject’s trip preparation.** Reconstruct details.

   a. **Equipment.** Why do we want to know exactly what kind(s) of equipment and clothing the subject has?

      - They are clues to survivability.
      - The type of footwear (description of sole pattern) is necessary for tracking.
- Colors of clothing and equipment are necessary for detectability.
- Types, brand names of clothing and equipment are necessary for determining clues.
- Equipment carried could influence the route or direction of travel.
- Determines the subject's signalling capabilities, i.e., whistle, flares, fire, strobe light, firearms, etc.
- Equipment carried influences the types of potential activities and potential whereabouts.
- By inventoring equipment, we can also assess the subject's capabilities and expertise.

b. **Experience.** The subject's experience (or lack of) needs to be determined as accurately as possible, and will have a bearing on your assessment of survivability, total distance traveled, potential activities and destinations, etc.

c. Be sure to talk with friends and relatives who knew the subject's trip plans. Were any alternate trip plans discussed?

2.5 **Physical condition of the subject.**

a. **Before the time of loss.** You need to get a feel for the normal day to day conditioning of the subject. Again, this information will influence your assessment of survivability, total distance traveled, potential activities, etc.

b. **At the time of loss.** Was the subject fatigued? Depressed? Cold? Hungry? Ill?

2.6 **Medical condition of the subject.** Determine if there are any known medical problems.

a. A family doctor may offer the best information. Family often distorts physical or mental health problems.

2.7 **Personality traits of the subject.**

a. Is the subject expressive, smart, assertive, realistic, confident, aggressive, independent, mature, composed, logical, optimistic, etc.

- Basically, does the subject have a positive mental attitude and a good self-image?

b. **Or, is the subject reserved, anxious, submissive, evasive, immature, unsure, pessimistic, neglectful, shy, depressed, etc.**

- Does the subject have a bad mental attitude and a poor self-image?
c. A personality profile can tell you a lot about the potential behavior of the subject.

2.8 Weather.

a. Analysis of the weather at the time of loss, at the present, and for the future will indicate the potential for:

- hypothermia
- hyperthermia
- restricted travel
- stationary, seeking shelter

2.9 Terrain analysis, in concert with all of the above categories of planning data, will help you to establish probable search areas (POA).

a. Consider:

- Is the terrain level or sloping?
- Are there terrain barriers?
- Are there routes by which the subject could have left the area?
- Do any confusion factors exist?
- Can sights or sounds of civilization be seen or heard?
- What were the possible short cuts?
- What are the paths of least resistance?

At this point, you should be able to begin making marks on a map. You are beginning to assess and assign probabilities of area (POA) so that field search activities can begin.
3.0 **SEARCHING DATA.** This is the information that must be given to your searchers.

If you do not have this information, then how can you realistically commit searchers to the field. Remember, a search without a subject is nonsense!

3.1 **Name to call.**
3.2 **Shoe print description,** to include tread, length, and width. Provide a drawing if possible.
3.3 **Clothing worn,** types, brands, colors.
3.4 **Equipment description,** especially items that could be easily discarded.
3.5 **Brands of cigarettes, gum, candy, other possible clues.**

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Planning and searching data must be obtained before you can realistically:

1. Establish the priorities and urgency.
2. Determine preliminary search area.
3. Apply initial search tactics and put searchers into the field.
4. Look for clues.

"Assumption is the mother of all screw-ups"

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**SEARCHING DATA**

- **NAME TO CALL**
- **SHOE PRINT DESCRIPTION**
- **CLOTHES WORN; COLORS**
- **EQUIPMENT (That could be discarded)**
- **BRANDS OF CANDY, CIGARETTES, ETC.**
NOTES:

PREPLAN - WHY

TO BE EFFECTIVE
TO BE EFFICIENT
THE FIRST NOTICE

OBJECTIVES: A student will be able to--

* Identify the various ways by which the responsible agency is notified of a potential SAR problem.

* Use a Lost Person Questionnaire form that is relevant to the local responsible agency's needs.

* Discuss the critical decision-making processes relevant to the information gathered during the First Notice phase.

* Discuss the continuous investigation process beginning with the First Notice.

References: "First Notice", an article by Jon Gunson
"Lost Person Questionnaire", edited by Butch Farabee.

"Regardless of how improbable or unfounded the report appears at the time, a compelling firehouse response is essential until SAR personnel have arrived on the scene and determined the accuracy of the information."

- Tim J. Setnicka, Wilderness Search and Rescue, 1980

DEVELOPING A PLAN

1. WHERE IS THE SUBJECT?

Case histories, statistics, models, deductive reasoning, intuition

2. HOW CAN I FIND THE SUBJECT?

PASSIVE - Confinement, perimeter cutting attraction, road blocks

ACTIVE - Trackers, dogs, aircraft, hasty teams, grid teams

1.0 INITIAL CONTACT - The impression that the report-taker gives the reporting party and the initial actions that are taken will set the tone for the rest of the mission. If the report comes into an agency, such as the Sheriff's Office, the degree of professionalism and responsiveness may affect future missions as well. A key word throughout a search is efficiency: the job must be done in a thorough and organized manner without wasting time or resources. The report-taker must immediately consider the following:
1.1 **PROPER ATTITUDE** - The right attitude regarding the mission is important from the very beginning. The initial contact with the reporting party (whether by phone, radio or in person) should be calm, professional, inquisitive and with a definite tone of concern and willingness to help. The report-taker cannot let the fact that he/she has been awakened from a good night’s sleep or called away from Christmas dinner interfere with the obligations as report-taker.

1.2 **NAME/CALL BACK NUMBER/LOCATION** - Wherever the initial report comes (Sheriff’s Office, Forest Service, etc.), the report-taker must consider that his/her top priority on lost person information is to get the name, phone number (where they can be reached now) and location of the reporting party. The party should be told to stay there until they are contacted to do otherwise. If it is reported in person, keep the reporting party at hand until all crucial information is obtained.

1.3 **SEARCH IS AN EMERGENCY** - From now, until the subject is found, time is precious and it must not be wasted. This does not mean, however, blasting full speed ahead without direction. It does mean making every minute count through careful, efficient planning and organization: in short, good coordination.

2.0 **INITIAL INFORMATION** - Initial information on the situation may be very complete or very sketchy. There are certain things which are important to know immediately, but now is not the time for recording a complete life history of the subject or even filling out the entire "lost person questionnaire." One must quickly sort out the pertinent information that is needed for immediate decision making. As Search Manager, you need to be able to evaluate the following information from the report-taker or the reporting party.

2.1 **MISSING HOW LONG** - The seriousness and urgency of the mission increases with the amount of time elapsed from a proposed return or meeting time (if any). Make sure there was no mistake or misunderstanding between the subject and the reporting party (or you and the reporting party) regarding times or even dates and days of the week.

2.2 **ACTIVITY** - What type of activity was the subject going to be doing, such as hiking versus rock climbing or cross country skiing versus snowmobiling. This is helpful not only in judging the danger of the activity but also in considering the amount of terrain which might have been travelled by the subject (hence, initial size of the search area).

2.3 **EQUIPMENT** - This information is often directly related to the activity, such as camping trip versus a day hike. At this point you are not looking for an itemization as much as a general idea of how well the subject was equipped to cope with the terrain and weather.
2.4 **NUMBER OF PERSONS MISSING** - Generally speaking, there is safety in numbers. The more people there are in a lost party the better their chances of being found in good condition as long as they stay together. The following data should then be obtained on each individual who is missing.

2.5 **AGE** - Again, generally speaking, the younger (below 15) or older (above 50) a person is, the more serious the problem. Young people often do not have the experience or presence of mind to take care of themselves, while with older people there is the increased possibility of complications from medical or aging problems.

2.6 **PHYSICAL CONDITION** - Keeping in mind that this is often a very subjective opinion from the reporting party, the primary thing you want to know is are there any known medical problems or handicaps, physical or mental.

2.7 **EXPERIENCE/ABILITY** - This is usually even more subjective than physical condition, but it is helpful to know general levels such as rank beginner verses experienced mountaineer.

2.8 **POINT LAST SEEN OR LAST KNOWN POSITION** - The more specific the better. If the reporting party cannot pin it down to any more than a region, you may have to enlist the help of another agency such as the Highway Patrol or Sheriff's Office to try to find the car the person was driving and then use that for a starting point.

2.9 **TERRAIN** - Knowing the potential search area should give you an idea of the type and degree of difficulty of the terrain. This will affect your evaluation of the situation, both in terms of the subject and the searchers.

2.10 **WEATHER** - This is another consideration that is determined by knowing the general area of search and that also affects your evaluation for the subject and searchers alike. Mountain weather can vary drastically from one area or elevation to another. It is also one of the most critical factors to be used in your evaluation of the problem. You should always investigate the weather at the time the party was lost as well as the current weather and the forecast for the specific area.

So what's the purpose of all this information?

1. To determine **where** to look.
2. To determine **how** to look.
3. To determine if you need any special resources.

3.0 **EVALUATION OF THE PROBLEM** - The information you receive from this "first notice" regarding a lost person can come from many different sources and in various degrees of reliability. The reporting party may have their own ideas about what you should do, but it is important for you to evaluate all of this initial information in a calm, intelligent manner.
3.1 **TALK TO THE REPORTING PARTY IN PERSON?** - Some Search Managers prefer to talk in person with the reporting party. You know better than anyone what questions you want answered and how to evaluate the answers. There may be no substitute for direct contact, but further delay until such contact can be carried out may not be warranted.

3.2 **EVALUATE THE INITIAL INFORMATION** - The first reports on a lost person usually consist of three general types of information. Each type is a perfectly valid source but each has its own relative level of reliability.

   It must be stressed, however, that no information should be totally discarded regardless of your initial evaluation.

   a. **CIRCUMSTANTIAL** - This is information that is generally not substantiated (at least not yet) by the report of some person. Examples of this might be a car left at a trail head but with no persons reported missing, or a sign-out sheet at the trail head and where the person had not signed back in.

   b. **SECOND HAND** - This information comes from a person who heard it from someone else. Generally speaking for oral information, the more people it has traveled through, the less accurate it has become. In any case it is usually better than circumstantial information. This category would also include the person who is reporting a subject as simply overdue from a removed location such as a distant town.

   c. **EYE WITNESS** - This is usually the best information and comes from an individual who was actually on the scene and is possibly a member of the party from which the subject is missing. This person should be able to confirm that someone is definitely missing and give you specific "last seen" information.

3.3 **EVALUATE THE SOURCE OF INFORMATION** - Consider the background knowledge and the state of mind of those persons who are giving you information. Do they understand your questions and do they have the background to answer them accurately or are they merely guessing? Are they distraught and frantic or calm and thinking clearly?

3.4 **CONSIDER THE FACTS** - Look at the information that you are reasonably certain of. This might include the weather and terrain of the area as well as the subject's age, sex and known medical problems. These facts can now form a foundation upon which to build the evaluation process.

3.5 **CONSIDER THE PROBABILITIES** - Consider those items which are not as definite as the "facts" but which are highly likely, such as the "probable" activity and the "probable" experience level of the subject. These may be items on which you should gather more reliable information if it is available without too much delay.
3.6 **CONSIDER THE POSSIBILITIES** - Now look at the information which is questionable but still usable. Maybe you have had various reports on the equipment carried and similar uncertainty as to the general physical condition of the subject. More investigation might be indicated while remembering that time is also critical at this point.

3.7 **COMBINE INFORMATION OBJECTIVELY** - Combine all of the information you have into an evaluation of the problem while keeping in mind the reliability of your sources and the relative accuracy of each item. From your "facts" regarding the terrain and weather conditions in the general search area you can assess some potential hazards as they relate to the subject's "probable" activity, type and level of experience. Then by taking into account his/her age, sex and "possible" physical condition, as well as evaluating the adequacy of his/her "possible" equipment list, you can begin to get an objective evaluation of the situation.

4.0 **GETTING MORE INFORMATION** - You must now move into the next phase of the mission. However, the information you have gathered so far is probably sketchy and certainly incomplete. Now, while you make decisions and actually begin the actual coordination of the operation, the information gathering process should still go on so that when you arrive on the scene you will have more information upon which to base your planning and strategy decisions.

4.1 **APPOINT INVESTIGATOR(S)** - This person's primary job is to gather, sort and evaluate information on the subject(s), the search area and the situation in general. During the operation he/she may never go into the field as an active searcher. He/she may operate completely by phone or may be the first person on the scene to interview the reporting party personally.

4.2 **PROTECT SCENT ARTICLES** - This may seem premature but it is best not to run the risk that usable scent articles will be washed, contaminated or unavailable if they should be needed later by search dogs. The best scent articles are articles of clothing which have been recently worn next to the skin of the subject and have not been washed, worn or handled by others. They should be carefully picked up with a stick or tongs, placed in a clean plastic bag and sealed, **NOT TREATED, OR SCENTED GARBAGE BAGS**.

**SUMMARY - MAJOR POINTS**

5.0 **HOW DOES THE REPORT COME IN?**

5.1 Overdue report by relatives or friends.
5.2 Report by member of party.
5.3 You can discover:

   a. abandoned vehicle
   b. registration system.
   c. deserted camp or equipment.
5.4 Distress signals.
5.5 Emergency Locator Transmitter.
5.6 Other Clues.

6.0 IMPORTANT CONSIDERATIONS

6.1 Get all the **information** necessary to determine:
   a. If there is a problem.
   b. How serious is it or could it get.
   c. Where is it.
   d. Who is involved.
   e. How did it happen.
   f. When did it happen.

6.2 Get all the information necessary to make decisions about **what to do now**.

   It is better to get more than enough information now rather than to have to go back and dig it up later.
   Saves valuable time in the long run.

6.3 Referring to the lost person questionnaire:
   a. What information do you need immediately to determine whether or not you have a problem?
   b. What information do you need to take initial action?
   c. What information could be gathered a little later?

   "The effort required to correct a course of action increases geometrically with time."
   Snowshoe Thompson, 1856

**SOME KIND OF RESPONSE SHOULD ALWAYS HAPPEN IMMEDIATELY.**

**SEARCH IS AN EMERGENCY**

*(if you can't call it an emergency, call it a sudden intensification of activity in response to an unplanned event.*
**LOST PERSON QUESTIONNAIRE**  
Edited by: Butch Farabee

**NOTE:** Use pencil/black ink, print clearly, avoid confusing phrases/words, unfamiliar abbreviations. Complete and detail answers for future use. Answer ALL questions, if possible.

**INCIDENT TITLE:** _______ **TODAY'S DATE:** _______ **TIME:** _______

**Officer Taking Info:** _______ **Incident #:** _______ **SAR #:** _______  


**A. SOURCE(S) OF INFORMATION FOR QUESTIONNAIRE**

Name: ________________ How taken (phone, etc.): ______________

Home Address: __________________________ Zip: _______

Phone #: ( ) _______ 2nd phone #: ( ) _______ Relationship: _______

Where/how to contact now: __________________________

Where/how to contact later: __________________________

What does informant believe happened? __________________________


**B. LOST PERSON**

Name: ________________ Sex: ______ Nicknames: ________________

Home Address: __________________________ Zip: _______

Local Address: __________________________ Zip: _______

Home Phone #: ( ) _______ Local phone #: ( ) _______

D.O.B.: ________________ Birthplace: __________________________


**C. PHYSICAL DESCRIPTION**

Height: _______ Weight: _______ Age: _______ Build: _______

Hair: Color: _______ Length: _______ Style: _______

Beard: _______ Mustache: _______ Sideburns: _______
Facial features/shape: __________________ Complexion: ______

Distinguishing marks: ________________________________

Overall appearance: __________________________________

Photo available: Y N? Where: _______ Need to be returned? ______

Comments: _______________________________________


D. TRIP PLANS OF SUBJECT

Started at: ___________ When: ___________ Time: ___

Going to: __________________ Via: __________________

Purpose: _________________________________________

For how long? _______ Exit date: _______ Group Size: ______

Done trip before?: __________________________________

Transported by whom/means: _________________________

Vehicle now located at: ____________ Type: ______ Color: _____

  License # ____ State: ___ Verified: Y N? Who: ______

Return time: _______ From where: ___________________

  By whom/what: __________________________________

Additional names, cars, licenses, etc. for party: ____________

Alternate plans/routes/objectives discussed: ____________

  Discussed with whom: _______________ When: _________

Comments: _______________________________________

_________________________________________________

_________________________________________________

_________________________________________________
E. CLOTHING

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<td>Footwear:</td>
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Sole type: __________ Sample available: ______ Where: ______

Scent articles available: Y N ? What: __________ Secured: Y N ?

Where now: _______________

Overall coloration as seen from air:

F. LAST SEEN

Time: ______ Where: ______________ Why/how: __________

Seen by whom: ______________ Location now: ______________

Who last talked at length with person: ______________

Where: ______________ Subject matter: __________
Weather at time: ____________ Weather since: ____________

Seen going which way: ______________ When: ____________

Reason for leaving: ______________________________

Attitude (confident, confused, etc.): ______________________________

Subject complaining of anything: ______________________________

Subject seem tired: _____ Cold/hot: _____ Other: ____________

COMMENTS: ____________________________________________

G. OUTDOOR EXPERIENCE

Familiar with area: Y N ? How recent: ____________ Other: ___

Other areas of travel: ______________________________________

Formal outdoor training: ______________ Degree: ____________

Where: ______________________ When: ______________________

Medical training: ______________ When: ______________________

Scouting experience: ______ When: ______ Where: ______

How much: ______________ Scout Leader: ______________


Rank: ______________ Other: ______________________

Generalized previous experience: ________________________

How much overnight experience: ________________________

Ever been lost before Y N ? Where: ____________ When: __

Ever go out alone: ______________ Where: ______________

Stay on trails or X-C: ______________________________

Now fast does subject hike: ______________________________

Athletic/other interests: ______________________________

Climbing experience: ______________________________

COMMENTS: ____________________________________________
H. HABITS/PERSOALITY

Smoke Y/N? How often: _____ What: _____ Brand: _____

Alcohol: _____ How often: _____ What: _____ Brand: _____

Recreational drugs: ___________ How often: _______________

Gum: _____________ Candy: __________ Other: ____________

Hobbies/Interests: _______________________________________

Outgoing/quiet: _______________ Gregarious/loner: ________

Evidence of leadership: ___________________________________

Legal trouble (past/present): _______________________________

Give up easily/keep going: ________________________________

Hitchhike Y/N? Accepts rides easily: _______________________

Personal Problems: _______________________________________

Religious Y/N? Faith: _____________ Degree: _____________

Personal values: _________________________________________

Philosophy: ____________________________________________

Person closest to: ____________ In family: _________________

Emotional history: _______________________________________

Education: Grade: _____ Current status: _____ Teacher(s): __

School name: _____________ College education: ___________

Subject/degree: __________________ Year: _________________

Local/fictional hero: _____________________________________

COMMENTS:

_________________________________________________________________________
I. HEALTH/GENERAL CONDITION

Overall health: ____________________________

Overall physical condition: ___________________

Known medical problems: _____________________

  Knowledgeable doctor: _______________ Phone # (   ) ___

Handicaps: ________________________________

Known psychological problems: ___________________

  Knowledgeable person: _______________ Phone # (   ) ___

Medication: ________________________________ Amounts: _______

  Knowledgeable person: _______________ Phone # (   ) ___

  Consequences of loss: _______________________

Eyesight without glasses: ________________ Spares: Y  N  ? __

COMMENTS:

_________________________________________

_________________________________________

_________________________________________

J. EQUIPMENT

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Pack:________________________________________

Tent:________________________________________

Sleeping bag: ________________________________

Ground cloth: ________________________________

Fishing equipment: ___________________________

Climbing equipment: __________________________

Liquid container: ____________________________

  How much fluid: ________________ What kind: ___
Fire Starter: Y N? What: __________________________

Light: __________ Stove: __________ Fuel: __________

Compass: __________ Map: __________ Of where: __________

How competent with map/compass: ________________

Knife: __________ Camera: __________ Lens: __________

Food: __________________ Brands: __________________

__________________________

Skiis: Type: ______ Brand: ______ Color: ______ Size: ______

Bindings: __________ Pole type: __________ Length: ______

How competent: ________________________________

Snowshoes: Type ______ Brand: ______ Color: ______ Size: ______

Bindings: __________ How competent: __________________


Money: Amount: ______ Credit Cards: __________________

Other documents: ________________________________

COMMENTS:

____________________________________________

____________________________________________

____________________________________________

K. CONTACTS PERSON WOULD MAKE UPON REACHING CIVILIZATION

Name: __________________________ Relationship: ________

Address: __________________________ Zip: ________

Phone #: ( ) ____________ Anyone home now? ________
L. CHILDREN

Feeling toward adults: _______________ Strangers: ______
Reactions when hurt: ____________________ Cry: ___
Training when lost: ______________________
Active/lethargic/antisocial: __________________
COMMENTS: __________________________________________


M. GROUPS OVERDUE

Name/kind of group: _______________ Leader: ___________
Experience of group/leader: ____________________________
Address/phone of knowledgeable person: ________________
Personality clashes within group: _______________________
Leader types other than leader: _________________________
Actions if separated: _________________________________
Competitive spirit of group: ___________________________
Intragroup dynamics: _________________________________
COMMENTS: __________________________________________


N. ACTIONS TAKEN SO FAR

By: family/friends: _______________ Results: ______

Others: _________________________ Results: ______

COMMENTS: __________________________________________

By: family/friends: _______________ Results: ______
O. MEDIA/FAMILY RELATIONS

Next of kin: _______________ Relationship: __________

Address: __________________________ Zip: ________

Phone #: ( ) _______ Occupation: ______________

Person to notify when subject found: _______ Relationship: __________

Address: __________________________ Zip: ________

Phone #: ( ) _______ Occupation: ______________

Significant family problems: ________________________________

Family's desire to employ special assistance: ________________

COMMENTS: ____________________________________________

______________________________________________________

OTHER INFORMATION

______________________________________________________

______________________________________________________

______________________________________________________

______________________________________________________

______________________________________________________

______________________________________________________

______________________________________________________

______________________________________________________
QUESTION LIST FOR ELT INCIDENT (DOWNED AIRCRAFT)

Date: __________________________ Time: __________________________

Party Calling: __________________________ Affiliation: __________________________

Call back #: __________________________ AFRCC #: __________________________

Questions to be asked:

1. Who is reporting ELT?
2. Is there a plane overdue?
3. Range ELT is being heard and strength?
4. Have RAMP checks been conducted/at all likely airports?
5. Weather?
6. When plane disappeared?
7. Was route or geographic area covered by (ITAP) Interim Track?
8. Has ITAP tape been pulled for review and study (source: FAA Flight Following)?
9. Number, age and sex of persons on board?
10. Aircraft type?
11. Route of flight?
12. Last known position?
13. Are maps available for area?
14. What transportation is available?
15. What assistance is available?
16. How long has ELT been going off? Type?
17. Can ground DF hear ELT? Where?
18. Projected weather next 48 hours?
19. Where and how do we meet?
20. What communications are available?
21. Who is in charge of mission?
22. Is CAP able to fly?
ORGANIZATION: MANAGEMENT OF SEARCH OPERATIONS

OBJECTIVES: A student will be able to:

* Discuss the functions, structure, and importance of an effective search organization.

* List and discuss the critical components of an effective search management system.

* Effectively organize a search and delegate appropriate functional responsibilities.

"Successful search management depends upon the efficient and effective utilization of available and potential resources applied to the problem at hand. Proper organization helps channel, apply, regroup, and evaluate resources to concentrate efforts, avoid redundancy, and promotes rapid recovery of the lost party".

- Tim J. Setnicka, Wilderness Search and Rescue, 1980

1.0 IMPORTANCE OF A GOOD ORGANIZATION.

1.1 Although most successful searches involve small search areas and few searchers and are resolved in a short time, occasionally the magnitude and complexity of a search exceeds routine operational capabilities. Search Managers are comfortable using their day-to-day response organization in managing the smaller searches; but when the hasty team fails to turn up the lost subject or even good clues, they must immediately begin to plan and organize for a potentially difficult and complex operation. It is at this point, in the rapidly emerging situation, that the need for a preplanned, dynamic organization becomes most critical. Management actions during the first few hours of an incident often mean the difference between success and failure.

1.2 There are three key elements which exist in every successful operation. The strength or weakness of each of these elements will influence the success or failure of the operation. Each of these elements is under the Search Manager's control.

* Resources - The manager must have the required equipment, people, and other resources available to respond. She/he must know their capabilities and how to acquire them for use.
*Strategy and Tactics* - The manager must know the fundamentals of search theory to develop sound incident objectives. She/he must develop an adequate plan for applying the proper resources in the most appropriate locations at the right time and in the right order to efficiently and effectively meet the objectives.

*Organize early - stay ahead of the power curve*

1.3 **Operational Objectives** - The ultimate objective of all searches is to locate the lost person in good condition. The Search Manager must also attempt to do so in the most effective and cost efficient manner. The state of the art today dictates the use of management by objectives in organizing, responding to, and managing the search incident. The manager must develop objectives for the search effort which are:

- realistic.
- attainable in a reasonable time.
- verifiable.

Good search objectives will allow the manager to direct his/her efforts toward those actions which are most likely to result in a successful mission. They will provide direction for the resources to operate most effectively. They will provide a means for evaluating mission progress and will allow for adjustments, if necessary, to ensure that the mission is running smoothly.

Written or not, search objectives must be developed early in the initial response phase and utilized judiciously throughout the mission to maintain direction and control of the emergency response.

2.0 **INTERAGENCY COORDINATION IS CRITICAL TO SEARCH SUCCESS.**

2.1 The level of care expected by the public today is higher than ever before.

Individual emergency response agencies cannot be (and are not) expected to provide all of the resources required to successfully resolve every situation.

Some specialization is necessary to cope with and to use the volume of information on search strategy and tactics available today. It is sometimes necessary to utilize all of this information to provide the expected level of care.

As a result, the trend in search management today is toward interagency mutual aid agreements, central resource coordination points (such as the AFRCC at Scott AFB), and greater utilization of highly trained and specialized resources.
2.2 To make maximum use of available resources and state of the art technology, a flexible management system is required. This system must integrate resources and technology and promote coordination and cooperation in search management. It must also provide for optimum control and efficient operations.

3.0 THINK FUNCTIONS, NOT PEOPLE.

3.1 In order to organize the response effectively, the manager must think of the job to be done in terms of functions or categories of tasks to be accomplished. Specific functions must be fulfilled, regardless of the number of searchers involved or the size of the search area. By thinking in terms of functions, it becomes easier to organize the response into a dynamic, emerging organization - one which changes to meet the increase or decrease in complexity of the situation.

3.2 In the early stages of a search, immediately following the first notice, one person may carry out all functions of the organization.

3.3 As the incident grows in size and complexity, the specific functions may also become more complex. At this point, the Search Manager must consider delegating the responsibility for managing or carrying out specific functions to other people who are trained and qualified to do so.

3.4 Failure to delegate functional responsibility to trained, capable assistants is a common cause of "information overload" and leads to an inefficient and/or ineffective emergency response.

*There is an inverse relationship between level of responsibility and physical workload. Delegate! and give yourself time to think and plan!*

3.5 "Think functions, not people" means that the most qualified person, regardless of rank or organizational status, should be delegated responsibility for managing each function as necessary. Although this may not be possible for some organizations due to structure, precedent, or procedures, it is a highly desirable goal. Search management should be "victim oriented". The chance for success is maximized when the most capable people are carrying out the required functions.
Organization is too often like a septic tank - the really big chunks rise to the top.

4.0 THE ON-SCENE SEARCH MANAGEMENT SYSTEM.

4.1 Many management systems have been proposed to solve recurring problems with emergency response on-scene. In most cases, the differences between these systems are rooted in definition and tradition rather than differences in principles or concepts.

4.2 Although various Search Managers utilize a number of incident organization and management structures, the Incident Command System (ICS) is gaining wide acceptance as the "state of the art" on-scene management system. It is currently used by many local county, state, and federal agencies to manage searches.

READERS, PLEASE NOTE:

The ICS framework for on-scene management seems to have the most potential for developing into a truly national management system. We also want students/readers to fully understand that this approach to management developed out of a need in the fire services. As a result, in some areas, it is still very fire oriented, both in nomenclature and application. However, the structure for an efficient management system is there and in place.

For the purposes of this text, we have applied the basic concepts of the ICS system to search management. As a result, there is a slight divergence from standard ICS doctrine and nomenclature. This chapter is not intended to fully orient or train managers in the ICS system. It is an attempt to begin the transition into a much needed standardized management system that is very efficient and functional.

We are aware that there is negative sentiment in some areas of the country because of the use of the word "command" in the system. Especially since SAR management is so dependent on cooperation and coordination rather than command authority. But this is a minor point and can be overcome or changed with effort and time.

Throughout this text, we have used the search function specific title "Search Manager". In the ICS system, this position would be designated, and synonymous with "Incident Commander".

Hundreds of jurisdictions are using ICS structure successfully. SAR Managers need only apply the concepts to precipitate an effective organization. Some work still needs to be done at the time of this writing on the nomenclature and application to the search and rescue community. As professionals, we all can contribute to that end by using the basic concepts and principles to develop this revolutionary approach to on-scene direction and control.
4.3 The ICS is highly flexible and adaptable to a variety of emergency situations. It can be used to manage a small search in which one person, the Search Manager (SM), performs all of the major functions. He/she directly supervises all of the searchers, developing and implementing an unwritten plan, providing the logistical support and managing the financial aspects of the operation.

1. As the search grows in size and complexity, the Search Manager can quickly delegate functional responsibilities to an operations chief, planning chief, logistics chief, and finance chief, or the SM can delegate only one function if that is all that is required to effectively manage the incident. In this case, the SM is still responsible for directly carrying out the functions which she/he has not delegated.

2. The ICS is organized around major functional units. It maximizes the responsibility of delegated functional supervisors for carrying out their functions.

3. This system also allows the SM to integrate local and inter-agency resources into an effective response organization without the problems of "turf", inadequate communications, or conflicting objectives. It allows all incident personnel to focus on the main objective - locating the lost person.

5.0 THE EIGHT CRITICAL COMPONENTS OF AN EFFECTIVE SEARCH MANAGEMENT SYSTEM.

5.1 Common Terminology

Whether discussing search team assignments or ordering resources, members of the search community must be able to communicate clearly with each other.

- An operations chief must know specifically what is expected of an individual filling that function.
- The manager must know that when a search team is ordered, she/he will be getting a specific number of trained personnel to accomplish a task.
- Facilities must have common, predetermined names. You and your local resources know that the Search Manager is located at base camp, but do the resources you have ordered from your neighboring county know this?
- The ICS establishes common terminology for functions, resources, and facilities.
5.2 Modular Organization

The organizational structure develops in a modular fashion based upon the size of search. The organization's staff expands logically with responsibility and performance placed initially with the Search Manager. As the need exists, four separate functional Sections can be added, each with several units which may be established. The specific organization structure established for any given search will be based upon the management needs of the situation. If one individual can simultaneously manage all major functional areas, no further organization is required. If one or more of the functions requires independent management, a qualified individual is named to be responsible for that function.

For ease of reference and understanding, personnel assigned to manage at each level of the organization carry distinctive organizational titles:

- ✔ Search Management - Search Manager
- ✔ Management Staff - Officer
- ✔ Section - Section Chief
- ✔ Branch - Branch Director
- ✔ Division - Division Supervisor
- ✔ Unit - Unit Leader

In the ICS, the first management assignments by the Initial Response Search Manager would be one or more Section Chiefs to manage the major functions. Section Chiefs further delegate management authority for their functions only as required. If the Section Chief sees the need, additional Units may be established within the Section. Similarly, each Unit Leader further assigns individual tasks within the Unit only as needed.

5.3 Integrated Communications

Communications at the scene should be managed through the use of a common communications plan and an on-scene communications center established solely for the use of tactical and support resources assigned to the search. All communications among organizational elements at a search should be in plain English. No codes should be used, and all communications should be confined only to essential messages. The Communications Unit is responsible for all communications planning at the search. This will include incident-established radio networks, on-site telephone, public address, and off-site telephone/microwave/radio systems.
5.4 **Unified Management Structure**

The need for a unified management is brought about because:

- Searches have no regard for jurisdictional boundaries.
- Searches often require multi-jurisdictional response.
- Individual agency responsibility and authority is normally legally confined to a single jurisdiction.

**The concept of unified management simply means that all agencies which have a jurisdictional responsibility at a multi-jurisdictional search contribute to the process of:**

- Determining overall search objectives.
- Selection of strategies.
- Ensuring that joint planning for tactical activities will be accomplished.
- Ensuring that integrated tactical operations are conducted.
- Making maximum use of all assigned resources.

A unified management structure could consist of a key responsible official from each jurisdiction in a multi-jurisdictional situation, or it could consist of several functional groups within a single political jurisdiction. It could also invite the advice of individuals or agencies having functional expertise or capability.

Common objectives and strategy on major multi-jurisdictional searches should be written. The objectives and strategies then guide development of the search action plan.

*Under a unified management structure the implementation of the search action plan should be done under the direction of a single individual - the Operations Chief.*

The Operations Chief normally will be from the agency which has the greatest jurisdictional involvement. Designation of the Operations Chief must be agreed upon by all agencies having jurisdictional and functional responsibility at the search, and could be identified in the preplan.

*Think functions - Not People*

- **COORDINATION**
- **SEARCH MANAGER**
- **INVESTIGATION**
- **SUPPORT SERVICES**
- **PLANS**
- **OPERATIONS**
- **COMMUNICATIONS**
5.5 Search Action Plan (SAP)

a. **The Search Action Plan is a plan for finding the lost subject.** Every search needs some form of an action plan. For small situations of short duration, the plan may not be written. The following are examples of when action plans should be written:

1. When resources from several agencies are being used.
2. When several jurisdictions are involved.
3. When the search will require changes in shifts of personnel and/or equipment.

b. **The Search Manager will initially establish objectives and make strategy determinations for the search based upon the requirements of the jurisdiction.** In the case of a unified management structure, the search objectives must adequately reflect the policy and needs of all the jurisdictions involved.

   The Search Action Plan must be dynamic and must be updated for each operational period.

c. **The Search Action Plan consists of the objectives and strategy along with an organizational chart, divisional assignments, and maps.** Larger searches may require additional attachments such as a communications plan, a medical plan, and a transportation plan. *(See greater detail and generic SAP forms in the Search Management: Planning Chapter.)*

5.6 Manageable Span of Control

Safety factors as well as sound management planning both influence and dictate span of control considerations. In general, the span of control of any individual with emergency management responsibility should range from three to seven - with five being established as the general optimum. Of course, there will be exceptions (e.g., an individual crew leader normally will have more than five personnel under supervision).

The nature of the task, hazard and safety factors, and distances among elements all will influence span of control considerations.

An important consideration in span of control is to anticipate change and prepare for it. This is especially true during rapid build-up of the organization when good management is made difficult because of many reporting elements.
5.7 **Designated Search Management Facilities** (See also Managing Search Base Operations Chapter)

There are several kinds and types of facilities which can be established in and around the search area. The determination of kinds of facilities and their locations will be based upon the requirements of the incident and the direction of the management team. The following facilities are defined for possible use.

**Search Base** - In search missions the Base is usually the location where primary management and support activities are performed. The Base will house all management equipment and personnel support operations. The Search Logistics Section, which is responsible for ordering all personnel, equipment, and supplies is also located at the Base. There is only one Base established for each search, and normally the Base will not be relocated. If possible, Search Base locations should always be included in the preplan. Normally included in the search base are the command post and the camp.

**Command Post** - Designated as the CP, the Command Post is the location from which all search operations are directed. There is only one Command Post for the search. The planning function is performed at the Command Post, and normally the Communications Center will be established at this location. The Command Post may be located with the Search Base if communications requirements can be met.

**Camps** - Camps are locations where resources may be placed to better support the search operations. At Camps, certain essential support operations (e.g., feeding, sleeping, sanitation) can be maintained. Also at Camps, minor maintenance and servicing of equipment may be done. Camps may be relocated if necessary to meet tactical and operational requirements.

**Staging Areas** - Staging Areas are established for temporary location of available resources on very short notice. Staging Areas will be established by the Operations Chief to locate resources not immediately assigned. A Staging Area can be anywhere in which mobile equipment can be temporarily parked awaiting assignment. Staging Areas may include temporary sanitation services and fueling. Feeding of personnel may be provided by mobile kitchens or sack lunches. Staging Areas should be highly mobile. The Operations Chief will assign a Staging Area Manager for each Staging Area.
Helibases - Helibases are locations in and around the search area where helicopters may be parked, maintained, fueled, and loaded with personnel or equipment. More than one Helibase may be required on a very large search. Once established, a Helibase usually will not be relocated.

Helispots - Helispots are more temporary and less used locations at which helicopters can land and take off to load or unload personnel or equipment.

5.8 Comprehensive Resource Management

Resources may be managed in three different ways, depending upon the needs of the search:

Single Resource - The smallest unit which can operate independently. Could be a helicopter, a search dog with handler, an ambulance, etc., each of which can be assigned as a primary Tactical Unit. A single resource is the equipment plus the required individuals to properly use it.

Task Force - A Task Force is any combination of resources which can be temporarily assembled for a specific task or objective. All resource elements within a Task Force must have common communications, and each Task Force must have a Leader. A Task Force is established to meet a specific tactical need and subsequently demobilized as single resources or reorganized into another Task Force configuration.

Strike Team - A Strike Team is a set number of resources of the same kind and type, which have an established minimum number of personnel. A Strike Team will always have a Leader and will have common communications. Strike Teams can be made up of search crews, search dogs, or any other kind of resource where the combination of single resources of the same kind becomes a useful tactical unit.

The use of Strike Teams and Task Forces is encouraged, whenever possible, to maximize the use of resources, increase the management control of a large number of single resources, and reduce the communications load.

In order to maintain an up-to-date and accurate picture of resource use, it is necessary that:

✓ All resources be assigned a current status condition.
✓ All changes in resource locations and status conditions be made promptly to the appropriate functional Unit.
**Status Conditions** - Three status conditions are established for use with tactical resources during the search operation:

- **Assigned** - Performing an active assignment.
- **Available** - Ready for assignment. All resources in Staging Areas should be available.
- **Out-of-Service** - Not ready for available or assigned status.

**Changes in Status** - Normally, the individual who makes the change in a resource’s status is responsible for providing that information to the central resource status-keeping function.

### 6.0 ORGANIZATION AND OPERATIONS

#### 6.1 There are eight key elements to on-scene direction and control in SAR.

6.2 These have proven their importance through many documented case histories:

a. All activity and operations in the field **must be victim oriented**.

b. **Identify all hazards**.

c. Do efficient **reconnaissance** (terrain analysis).

d. Protect the **access to the search base site**.

e. Monitor and control communications flow and volume; and always have a back-up.

f. **Brief and debrief** as a matter of routine.

g. **Establish victim care** as soon as possible.

h. Establish and log subject's destination and ETA at a medical facility.

#### 6.3 Potential Problem Areas On-scene.

a. Identifying all responders on-scene.

b. Responder units or individuals staying with their assigned tasks.

c. Relief of overhead/command staff and support people.

d. Ability to shift gears into expanded operations.

e. Use of resources within their abilities and expertise.

#### 6.4 During a major search, specific unified management structure functions must be addressed.

a. The research is clear and very specific. **The big four operational problems** continue to arise consistently during emergency response of any kind throughout this country.

1. **Ambiguity of authority**.
2. **Inability to communicate between agencies**.
3. **Poor use (or no use) of specialized resources**.
4. **Unplanned negative relationships with the media**.
b. Key elements for success in SAR operations.

1. **Good coordination of resources** - use the right people and physical resources to do the job.

2. **Communications** - be able to talk to everyone in the field!

3. **Good management practices** - Delegate and Manage!

6.5 According to basic ICS doctrine, there are **five major functional categories or tasks that must be accomplished**. These five functions are:

- **Command**
- **Logistics**
- **Operations**
- **Finance**
- **Planning**

6.6 However, the research is clear. There are functions within those divisions that continually cause significant operational problems. As a strategy to prevent those problems from constantly reappearing, we are suggesting that the organizational structure be modified and/or expanded at this major function level, to meet the demands of these operational problems.

6.7 Whether a local organization decides to adhere to basic ICS doctrine or modifies their system, state-of-the-art search management dictates that certain functional positions be assigned staff responsibility as the mission escalates. Failure to do so has repeatedly caused operational problems in the past. In the application of search management to the ICS organizational structure, consider the following functional positions as essential to mission management success. They can be grouped under the five major functional areas identified in ICS or expanded at the functional level to specific identities of their own. Both structures can function equally well.

<table>
<thead>
<tr>
<th>SAR Manager</th>
<th>Logistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations</td>
<td>Communications</td>
</tr>
<tr>
<td>Planning</td>
<td>Finance</td>
</tr>
<tr>
<td>Coordination</td>
<td></td>
</tr>
</tbody>
</table>

**Plus additional functions to include:**

- Media-relations
- Liaison (with other jurisdictions/agencies)
- Safety
- Technical analysis

6.8 **A closer look at these functions establishes very specific roles and responsibilities:**
a. **On-Scene Management**☆ (Direction and Control) is responsible for:

1. All on-scene activities.
2. Minute to minute decisions.
3. Establishing "CP" site.
4. Establishing consensus from the "overhead team"
5. Carrying out policy, etc.
6. Establishing communications with the dispatch or local responsible agency main office.

b. **Operations**☆ is responsible for transforming search objectives and strategies into on-scene actions plus:

1. Carrying out tactical activities.
2. Committing resources.
3. Doing what needs to be done now
   - air
   - water
   - ground
4. Operations implements the tactical aspects of the Search Action Plan and assigns operational work assignments based on the contents of that Plan. All operational decisions are made to reflect and support the Action Plan and its search objectives.

c. **Planning**☆ is responsible for:

1. Getting information about:
   - What has happened.
   - What is happening.
   - What will likely happen.
2. Maps, records, photos, meteorology, etc.
4. Establishing strategy.
5. Demobilization.

d. **Coordination**☆ is responsible for:

1. Getting the right resources from other agencies, organizations and jurisdictions to do the job.
2. Resource information management:
   - Inventory of all resources;
   - Easily updated, rapidly retrievable organized information;
   - Cost accounting figures for resources to be used;
   - Maintenance, deployment, recall and use.

e. **Logistics**☆ is responsible for:

1. Whatever is necessary to support operations.
2. Providing supplies and equipment to carry out the mission.
3. Transport, medical, food, sleep facilities, personal hygiene, etc.
f. Communications is responsible for:
1. Installing, maintaining and operating necessary communications networks.
2. Interface between communications systems.
3. Messengers, operators, message logs and improvisation.

g. Finance is responsible for establishing costs for:
1. Damage survey (lost or damaged property);
2. Resource costs (actually used);
3. Injury claims/compensation;
4. Man/hours/days;
5. Documentation and logs.

h. Additional separate functions to consider:
1. Media Relations - PIO.
2. Safety - Risk Analysis.
3. Liaison - Better inter-agency coordination.
4. Technical analysis - Special problems.

6.9 When agencies can communicate with each other and work together to support one another, they will find ways to become more efficient and effective. They will get acquainted and better understand each other's strengths, weaknesses, and responsibilities. Turf problems can be settled, giving way to a climate of understanding and support.

Good organizational structure does not just happen, it must be made to happen.

7.0 SUMMARY

IN THE FINAL ANALYSIS, IT IS THE VICTIM WE WORK FOR

7.1 The Incident Command System or an equivalent organizational structure based on this system can bring together many autonomous agencies and organizations, each with its own jurisdictions, policies, funding, and other capabilities and constraints. Cooperative agreements and associations have been established using this structure that have been unknown during past emergency response. Most of the concepts are not new. But in the past, they have not been brought together in a workable system that gave benefit to all emergency response organizations. The ICS and variations of its basic concepts have been successfully used to improve all aspects of emergency response throughout the nation.
7.2 From past experiences specific to both search management and emergency response in general, we know that there are some specific organizational pitfalls that deserve special emphasis. In addition to the five major functional areas described by ICS doctrine, there are additional functions that continue to cause operational problems. The research is clear that failure to give special emphasis to these functions will result in a less effective search mission:

a. Investigation.
b. Liaison and coordination (with other jurisdictions, agencies and resources).
c. Communications.
d. Media Relations (PIO).
e. Safety and technical analysis.

SUCCESS ALWAYS OCCURS IN PRIVATE, FAILURE IN FULL PUBLIC VIEW!

For further information on NIIMS and ICS write or contact:

International Fire Service Training Association
Fire Protection Publications
Oklahoma State University
Stillwater, Oklahoma 74078
(405) 624-5723

or

The Boise Interagency Fire Center
3905 Vista Avenue
Boise, Idaho 83705
MAJOR INCIDENT ORGANIZATION

* INCIDENT COMMANDER
  COMMAND STAFF
    - SAFETY OFFICER
    - ASSISTANT SAFETY OFFICERS
    - LIASON OFFICER
    - AGENCY REPRESENTATIVES
    - INFORMATION OFFICER
    - ASSISTANT INFORMATION OFFICERS

* LOGISTICS SECTION CHIEF
  SERVICE BRANCH DIRECTOR
    - COMMUNICATIONS UNIT LEADER
      - HEAD DISPATCHER
      - INCIDENT DISPATCHERS
      - MESSAGE CENTER OPERATOR
      - MESSENGERS
    - MEDICAL UNIT LEADER
      - AMBULANCE OPERATION
    - FOOD UNIT LEADER
      - COOK (KITCHEN CREW)
      - ASSISTANT COOK
      - HELPERS
  SUPPORT BRANCH DIRECTOR
    - SUPPLY UNIT LEADER
      - ORDERING MANAGER
      - RECEIVING AND DISTRIBUTION MANAGER
        - RECORDERS
        - HELPERS
        - TOOL AND EQUIPMENT SPECIALIST
          - TOOL ATTENDANT
    - FACILITIES UNIT LEADER
      - SECURITY MANAGER
        - SECURITY PERSONNEL
      - BASE MANAGER
        - FACILITY MAINTENANCE SPECIALISTS
      - CAMP MANAGER(S)
        - FACILITY MAINTENANCE SPECIALISTS
        - SECURITY PERSONNEL
    - GROUND SUPPORT UNIT LEADER
      - EQUIPMENT MANAGER
        - EQUIPMENT TIMEKEEPER
        - MECHANICS
        - DRIVERS/OPERATORS

* OPERATIONS SECTION CHIEF
  STAGING AREA MANAGER
    - AIR OPERATIONS DIRECTOR
      - HELIBASE SUPERVISOR
    - HELICOPTER MANAGER(S)
    - FIXED WING BASES
    - AIR ATTACK SUPERVISOR
      - HELICOPTER COORDINATOR
      - AIR TANKER COORDINATOR
      - BRANCHES (UP TO 5)
        - DIVISIONS/GROUPS (UP TO 25)
          - STRIKE TEAMS
          - TASK FORCES
          - SINGLE RESOURCES

* PLANNING SECTION CHIEF
  RESOURCES UNIT LEADER
    - STATUS RECORDERS
    - CHECK-IN RECORDERS
    - SITUATION UNIT LEADER
      - DISPLAY PROCESSORS
      - FIELD OBSERVERS
      - WEATHER OBSERVER
    - DOCUMENTATION UNIT LEADER
      - ASSISTANT
    - DEMOBILIZATION UNIT LEADER
      - RECORDERS
      - TECHNICAL SPECIALISTS
        - WATER RESOURCES
        - RESOURCE UTILIZATION
        - ENVIRONMENT
        - TRAINING
        - FIRE BEHAVIOR
        - ETC.

* FINANCE SECTION CHIEF
  TIME UNIT LEADER
  PROCUREMENT UNIT LEADER
  COMPENSATION/CLAIMS UNIT LEADER
  COST UNIT LEADER
SEARCH MANAGEMENT: PLANNING

OBJECTIVES: A student will be able to—

* Discuss the importance of search planning.
* Describe the components of the Search Action Plan.
* List considerations involved in search planning.

NOTE: This chapter adapted primarily from material written and edited by Hugh Dougher and Paul Anderson.

DEVELOPING A PLAN

1. Where is the subject?
   Case histories, statistics, models, deductive reasoning, intuition

2. How can I find the subject?
   PASSIVE — Confinement, perimeter cutting, attraction, road blocks
   ACTIVE — Trackers, dogs, aircraft, hasty teams, grid teams

1.0 THE IMPORTANCE OF SEARCH PLANNING

1.1 Planning is the glue that binds the resources together, producing a coordinated, effective emergency response.

1.2 Planning transforms the search objectives into realistic strategies and tactics (actions) to resolve or control the search.

1.3 Planning ensures effective, efficient use of available and potential resources applied to the problem, reducing redundancy and confusion, evaluating success, and focusing efforts directly into resolution of the emergency.

1.4 Planning is a key component of operational success. It must be a conscious, ongoing function.

1.5 Operational planning differs from preplanning, but is based upon the preplanned information.

1.6 All search operations follow similar patterns. Planning, both pre-incident and search action planning, reduces the time needed to conclude the emergency by speeding up the transition from reaction to proaction. Planning keeps search operations "ahead of the eight ball".
1.7 Every search requires a plan. In small searches it may be unwritten, in larger ones it must be written. Especially when:

1. Several agencies are involved.
2. More than one jurisdiction is involved.
3. More than one operational period is involved.

2.0 THE SEARCH ACTION PLAN

2.1 The Search Action Plan defined:

a. A plan for successfully resolving the search.

   - must be dynamic (flexible).
   - must be updated for each operational period.
   - must be only one plan for the operational period.

2.2 The role of the Search Action Plan in Operations is extremely important to the overall search management effort. It should provide the operations function with the following:

1. Defined operational periods.
2. Written search objectives reflecting the policy and needs of all jurisdictions.
3. Divisional assignment lists (tactical assignments).
4. Organizational chart.
5. Search maps delineating assignment areas.
6. Communications plan.
7. Resource status and availability.
8. Mission situation/status reports.
10. Situation predictions.
11. Medical plan.
12. Transportation plan.
13. Subject profile.
14. Safety considerations for weather, hazards, etc.

"Search operations is where the rubber meets the road and the planning effort gets its report card."

Rick LaValla, 1986
2.3 Search Action Plan Development.

a. Developed by the Plans Section in consultation with general staff.

b. Initially prepared at first planning meeting.

- Search Manager establishes information requirements and reporting schedules for all organizational elements.

- Search Manager presents general control objectives and alternatives which define legal, policy, resource, and fiscal constraints for the search in accordance with the preplans and policies of the involved jurisdictions.

- Operations and objectives are discussed with general staff relative to:

1. Resource status and availability.
2. Situation status including hazards, risks, work accomplishment.
3. Situation predictions.
4. Communications capabilities.
5. Weather.

c. Plans Section then takes this information and develops the Search Action Plan (SAP).

- Coordinates strategies with Operations Chief.
- Coordinates resource support and service needs with Logistics Chief.
- Develops the SAP in written form with alternatives.
- Presents plan to Search Manager for approval.

d. Plans Section conducts briefing of general staff.

e. Plans Section makes necessary adjustments to the plan and duplicates and prepares for distribution at field team leader briefing.
3.0 CONSIDERATIONS INVOLVED IN SEARCH PLANNING

3.1 Avoiding Alligators - As the prophet said: "When you are up to your ass in alligators, it is difficult to remind yourself that your initial objective was to drain the swamp." Good planning is alligator control. Proper management of information can avoid irritations and distractions, and allow all aspects of the search to focus on draining the swamp.

3.2 Information management - A good deal of search planning involves the management of information. Properly managed information can reveal guideposts to logical actions (i.e. a plan). Among the items the Plans Section Chief considers when developing strategy includes:

- investigation results.
- subject profile.
- lost subject behavior data.
- search resources available: types, how many, for how long, and training.
- terrain and vegetation analysis.
- weather.
- outside political pressures.

This is a lot of information, and it can be overwhelming. But if organized and filtered correctly it provides clear direction and ensures effective use of resources. Some ideas on how to collect and manage this information follow.

3.3 A Logical Sequence for Planning a Search Effort.

a. Assign the Plans Function Early. By the time hasty searches, confinement, and investigation are underway the effort has expanded to the point that a Search Management Structure should be evolving. One of the first positions that needs to be assigned is the Plans Section Chief.

b. SITSTAT. To manage the expected flood of information the Plans Section Chief should immediately assume or assign someone the responsibilities of Situation Status Leader (SITSTAT). This person manages all data thru the use of maps, T-cards, assignment summaries, and other tools discussed in detail below. Delays in establishing SITSTAT will result in loss of data caused by poor documentation. SITSTAT is normally a full-time responsibility.

c. RESTAT. The other critical Plans Section position is the Resources Status Leader (RESTAT). This person maintains current records on the status of all resources. This may be a full-time position, or it might be combined with the responsibilities of Check-In Recorder, Timekeeper, or SITSTAT.
d. **Determine appropriate action.** Identify the range of possibilities that might have caused the person to become lost or overdue. Then prioritize response to the potentially most life threatening or serious. For instance, on a missing child report, several high priority possibilities might become apparent, such as a water accident or kidnapping. Thus a high level of response is warranted to investigate these two possibilities, and less urgent responses to deal with the others.

**This worst case concept has applicability in all planning sequences, and is especially useful in the initial response when either available information indicates a low overall urgency, or limited resources force a focusing of efforts.**

---

e. **Develop a Subject Profile.** This profile will be useful in:

- defining search objectives.
- estimating resource needs.
- determining strategy.
- mapping the search area.
- briefing search teams.

**Subject profile should consider a discussion of the lost person's survivability relative to the person, weather, and other conditions.** (See Chapters on Determining Search Urgency and Subject Behavior.)

f. **Establish Search Objectives.** These should address the following questions:

- How much time do we have to find the subject alive? (Consider weather, subject profile, statistics and any other subject survivability factors.)

- How large an area will we ultimately search?

- What final POD can we accept (how thoroughly will we search)?

When these objectives are accomplished, the search generally de-escalates. Therefore the **search objectives usually prescribe a level of thoroughness for searching a large area.** The search objectives must be developed and approved in concert with the Search Manager.

g. **Determine and man the boundaries of the search area.** Consider theoretical, statistical, deductive and subjective methods, search objectives, subject profile, and lost subject behavior data.
h. **Segment the search area.**

- **Use features that are visible in the field** whenever possible. Features can include ridgelines, streams, fences, roads, vegetation changes, stringlines, and streamer lines.

- **Make the segments small enough** to permit assigned resources to cover entire segments in one effort.

- **Segment boundaries must not be realigned once search efforts begin.** Any realignment horribly complicates cumulative POD and shifting POA computations. However, combining and subdividing segments can be done if necessary. Erase, add, but do not reroute boundaries.

i. **Determine Probability of Area.** There are a number of ways of doing this. A popular method is the group consensus method (Mattson System) as follows:

- ✓ Organize a committee of three to six key people.
- ✓ Brief committee on all known search information.
- ✓ Have each committee member distribute his/her 100% among the designated segments and the possibility the subject is out of the area as well.
- ✓ Average the percentages for each segment to obtain the POA for each segment and outside the area also.

Realize that complexity increases as the number of segments and/or committee size increases.

j. **Estimate acreage.** Use a template to determine the size of each segment. Knowing the area of each segment is necessary for determining PDEN, and is useful to help estimate the time needed for resources to complete assignments.

k. **Determine Probability Density.** Probability density (PDEN) is the probability that the lost person is in a given segment, divided by the size of that segment (PDEN = POA/Size). The higher the probability density, the greater the chance of finding the subject faster; i.e. a higher POA per square foot. Consideration should be given to searching segments with the highest PDEN's first.

l. **Prioritize segments.** Consider subjective, statistical, investigative and deductive factors, subject profile, debriefing information, and compare this data with probability densities. By now a few segments will begin to appear as having the most likely chance of containing the subject.
m. **Resources.** Work up an estimate of the total resources needed to achieve the search objectives. Consider:

- the type of resources needed or available.
- how long each is available.
- time available vs. area to be covered.
- estimated POD for each resource.

n. **Encourage Input.** Don't plan in a vacuum. Searchers, family, and locals will have good ideas, some of which you may not have considered. **Obtain their input by methods such as:**

- directing agency and family liaisons to solicit suggestions and forward these ideas to the Plans Section.

- organize a brainstorming session:

1) **Invite key people to participate,** including the Search Manager, Operations Section Chief, selected family members, representatives of participating organizations, individuals with special knowledge of the search area, persons well skilled in strategy and tactics, and freelance locals.

2) Provide a briefing.

3) Allow each person two to five minutes to make and justify recommendations. List each of these on a flip chart or blackboard.

4) After everyone has made recommendations, provide a certain amount of time for discussion.

**These techniques allow everyone the opportunity to provide input, draws the freelance locals into the operation, provides for the family to participate, identifies original ideas while still allowing decisions to be made in a timely manner, and saves time.**
o. **Prepare Assignments.** Assignments must be written.

- Sketch all assignments on overheads. Combine all overheads of assignments for one operational period over a map and photocopy. Additional instructions are written on separate paper. Both the photocopied map and the instructions are prepared as decisions are made. A copy of the map and instructions, together with other information such as subject profile, incident objectives, communications plan, and debriefing questionnaire serve as the briefing packet to be given to each team leader by operations. This method minimizes preparation time, provides for fast briefings, serves as documentation, can be carried into the field, minimizes confusion, and lets everyone know what everyone else is doing.

- Also, list team assignments in large letters on flip chart paper or blackboard and post for quick reference at Plans. Include columns for status and accomplishments. These charts allow for quick reference and comparisons.

p. **Coordinate.** Coordinate with Operations for implementation of the plans.

q. **Plan for Operational Phases:** Always plan at least 12 hours in advance. Outline a general plan for the next shift, subject to revision as further information is received. Meet with Operations and Logistics and lay the groundwork for the following phases:

**INITIAL RESPONSE:** This phase of the response to a search mission can be the most difficult. In general, it is:

- aimed at high probability areas.
- approached with speed as a priority.
- the first few hours of the mission.

**FIRST OPERATIONAL PERIOD:** This phase of the mission includes the initial response phase and is generally:

- aimed at high probability areas that have been determined by the initial response.
- approached with speed and efficiency as priorities.
- considered the first days search effort. It usually ends at either 6 p.m. or 6 a.m. depending on when the initial response took place.
SECOND OPERATIONAL PERIOD: This phase is normally the first full 12 hour operational period of the search mission. Generally it is:

- aimed at NEW high probability areas and secondary search areas that have been previously covered.
- approached with efficiency and thoroughness as priorities.
- terminated at either 6 p.m. or 6 a.m. depending again on when the initial response was started and continues for 12 hours.

SUBSEQUENT OPERATIONAL PERIODS: This phase of the search mission will probably follow the planning process started during the first full operational period regardless of when it was started. This phase is generally:

- aimed at high and low probability areas simultaneously.
- approached with efficiency and thoroughness.
- involves 12 hour periods of time throughout the rest of the search mission.

Review, and if necessary, revise the search objectives, resource needs, subject profile, urgency, etc.

1. **Debrief.** Debrief returning team leaders (or teams). Document debriefing information on transparencies overlaid on master map.

2. **Crunch Numbers.** Prepare a summary of shift efforts:

   ✓ calculate cumulative POD for each segment.
   ✓ calculate shifting POA for each segment.
   ✓ list highlights of shift.

The new cumulative POD's and shifting POA's will indicate new segments having the highest POA's, and are critical to updating strategy. The calculations are not difficult, but are repetitive. It can take hours to compute by hand cumulative POD's and shifting POA's for a search area having ten segments, and most search areas have more than ten segments. A computer can shorten the time needed to compute the calculations to 30 minutes. Programs to accomplish these calculations are available from various sources.

3. **Brief.** Brief next shift's general staff. However it's not always necessary for Plans to be active 24 hours per day. In most searches the Plans Section can complete it's responsibilities in 15-16 hours. This may be preferred as it allows for greater continuity, avoids the need for consuming briefings to the relief shift, and releases persons to other tasks.
AN EXAMPLE

SEARCH PLANNING TIME TABLE

6:00 - Shift change (field personnel).
6:00-7:00 - Debrief personnel coming in from field.
7:30 - Brief new overhead shift.
8:00 - Overhead shift change.
8:00-11:00 - Collect and evaluate data, document action, restat, sitstat, develop predictions for next shift.
11:00 - Planning section meeting: Develop alternatives, make section assignments for overhead briefing meeting preparation.
12:00-2:00 - Prepare overhead briefing/strategy meeting.
2:00-3:00 - Conduct management and general staff briefing (planning meeting).
3:00-5:00 - Prepare Search Action Plan: Develop, assemble, duplicate, update.
5:00-6:00 - Present briefing to field personnel.
6:00 - Shift change (field personnel).

(Repeated for each subsequent 12-hour period)
THE PLANNING CLOCK

PLANNING SECTION MEETING
(Develop options – make assignments)

COLLECT/EVALUATE DATA
  - DOCUMENT
  - RESTAT
  - SITSTAT

PREDICT

PLANNING SECTION
SHIFT CHANGE

PREPARE BRIEFING

CONDUCT COMMAND
AND GENERAL
STAFF BRIEFING

DEVELOP, ASSEMBLE
AND DUPLICATE
INCIDENT ACTION PLAN

DEBRIEFING

SHIFT CHANGE

BRIEFING (Incident Action Plan)
SUGGESTED ITEMS FOR A PLANNING KIT

Briefcase - Soft cordura is easier to transport than stiff leather.
50 clear 8 X 11 transparencies.
Selection of water soluble overhead projector pens.
Selection of alcohol soluble (permanent) overhead projector pens.
Erasers for above pens.
Template for determining area.
T-card organizer, or 3 X 5 index cards.
Field Coordinator's Guide "Search Is An Emergency"
Lost subject behavior statistics for area.
Field Operations Guide (ICS-420-1)
Form ICS 201 (Resources Summary)
Form ICS 202 (Incident Objectives)
Form ICS 205 (Incident Radio Communications Plan)
Form ICS 214 (Unit Log)
Diskette(s) of search program(s)
Several blank diskettes
Laminated map(s) of search area. Used for planning in the field, or on briefing bulletin board at incident command.

OTHER SUGGESTIONS

Don't make it worse.

Don't let the management of the search generate its own special problems. Troubleshoot early, and encourage everyone to keep sight of the search objectives.

There is an inverse relationship between level of responsibility and workload; the higher the responsibility, the less the workload. Managers are paid to think, not man the production line. The Search Manager, and to a lesser extent, the Plans Section, Operations, and other Chiefs should save themselves for the main events and refuse to be drawn into trivia. As managers they need to be available to their subordinates, and have time to evaluate, and think ahead. Good managers delegate as much as possible so they are prepared to handle the additional problems that are sure to appear.

The only thing worse than a bad decision is indecision. There is no such thing as a 'bad' decision if it is made in good judgement based on available information.

Searches are great opportunities to receive on-the-job training in managing large incidents. Take advantage of this by assigning inexperienced persons to various overhead operations to "Shadow Train".

A common problem on many searches is the down time of search teams as they wait for additional assignments. And briefing teams by radio congests communications. These problems can be minimized by giving each team secondary and alternative assignments during the initial briefing.
INVESTIGATION

OBJECTIVES: A student will be able to--

* Discuss the importance of investigation.
* Discuss why the investigation process does not end until the subject is found.

**INTERVIEWING IS THE MAJOR TOOL FOR INVESTIGATION**

1.0 THE IMPORTANCE OF INVESTIGATION

**SEARCH IS THE CLASSIC MYSTERY**

1.1 The lost person incident is often a classic mystery. All of the clues are available and the solution reachable, if the investigation uncovers the clues, and if those responsible use them correctly.

1.2 Too often, good investigative techniques are not used in lost person incidents, or are initiated too late into the progress of the mission.

Search mission reports often contain numerous examples of where critical information was discovered, or even volunteered by someone, several days after the first notice. Often this information could have had a significant bearing on early decisions, thereby possibly saving time, effort, money and perhaps lives.

2.0 THE PRIORITY FOR INVESTIGATION

2.1 Investigation should begin immediately with the FIRST NOTICE. Typically, some type of lost person report is taken. The qualities of a good lost person report are:

a. Data critical to making immediate decisions is obtained first - and quickly.

b. Detailed Planning Data and Searching Data are obtained.

c. The lost person report serves as a checklist or reminder of even remote possible considerations, reducing the chances of overlooking anything.
NOTE: Refer to the First Notice Chapter for an example of a detailed lost person report. It could be divided into several parts for progressive data gathering.

2.2 From the start of the FIRST NOTICE until the location of the subject, or a decision to suspend (though investigation may not stop in this case) INVESTIGATION should be continuous.

Typically, after the initial lost person report is completed, investigation tends to become more low-key and haphazard, often until something critical comes to light, sometimes quite some time later.

2.3 Organizationally, the INVESTIGATION function should be a separate one from the outset. It is important to immediately designate someone to be responsible for carrying out this function. Investigation should be in detail and continuous.

The PREPLAN should specify the importance of investigation and identify resource persons to accomplish it.

3.0 SOME CONSIDERATIONS IN INVESTIGATION

3.1 Table [INV-1] provides a checklist for investigation. Information about all items listed should be obtained and considered as soon as possible.

It is easier to dismiss information that you have when it is not needed, than to find out too late that you needed information, or to receive information after the need was critical.

4.0 CRIMINAL POSSIBILITIES

4.1 Every lost person incident must be treated as if it has criminal possibilities until absolutely proven otherwise. Three possibilities stand out:

When you have eliminated the impossible, whatever remains, however improbable, must be the truth."

- Sir Arthur Conan Doyle
a. **Staged Incident** - Social, economic, and moral influences contribute to the potential that, at any given time, a person may stage an incident to make it appear as if he or she is lost, but in actuality, he or she has purposely staged a disappearance.

b. **Homicide** - Cases are known where deranged persons have preyed upon unsuspecting persons in remote areas, assaulting or killing them. In addition, one must always consider: Where better place to carry out a planned homicide (made to look like an accident, such as a fall) than in a remote or wilderness location, then reporting the victim as lost.

c. **Kidnapping** - Could be either a well planned or spur of the moment action on the part of a person with criminal intent. Children are particularly vulnerable.

4.2 Whenever the investigation begins to show a possibility of criminal action, specialized resources for criminal investigation should be used.

4.3 In the event the subject is found dead or badly injured, searchers must bear in mind crime scene protection considerations.
<table>
<thead>
<tr>
<th>INFORMATION, &quot;LEAD&quot; OR CLUE</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Subject Profile at point last seen</td>
<td>1. Companions</td>
</tr>
<tr>
<td>2. Equipment Possessed by Subject</td>
<td>2. Companions, relatives, friends</td>
</tr>
<tr>
<td>3. Intended Route, Trip Plans</td>
<td>3. Companions, relatives, friends</td>
</tr>
<tr>
<td>4. Actual Route - Subsequent Sightings</td>
<td>4. Witnesses from area</td>
</tr>
<tr>
<td>5. Subject Experience</td>
<td>5. Companions, friends, co-workers, relatives, past companions</td>
</tr>
<tr>
<td>6. Physical Condition</td>
<td>6. Companions, friends, relatives, doctor, clergyman, co-workers</td>
</tr>
<tr>
<td>7. Mental Condition</td>
<td>7. (Same as #6)</td>
</tr>
<tr>
<td>8. Recent Changes in Behavior,</td>
<td>8. (Same as #6)</td>
</tr>
<tr>
<td>9. Habits, Drugs, Medicines, etc.</td>
<td>9. (Same as #6)</td>
</tr>
<tr>
<td>10. Mental Attitude - How would subject react when lost</td>
<td>10. (Same as #6)</td>
</tr>
<tr>
<td>11. Relationship with wife, children, parents, friends, co-workers</td>
<td>11. (Same as #6)</td>
</tr>
<tr>
<td>12. Criminal history</td>
<td>12. Relatives, friends, co-workers, local law enforcement</td>
</tr>
<tr>
<td>13. Financial Situation, Debts, Withdrawals, etc.</td>
<td>13. Relatives, friends, financial institutions, creditors</td>
</tr>
<tr>
<td>14. Confirmation of equipment (footwear sole pattern, etc.)</td>
<td>14. Relatives, friends, store where purchased</td>
</tr>
<tr>
<td>15. Photographs</td>
<td>15. Relatives, friends, school</td>
</tr>
<tr>
<td>17. Background check of subject's companions</td>
<td>17. Relatives, co-workers, other companions, law enforcement</td>
</tr>
</tbody>
</table>
INTERVIEWING

OBJECTIVES: A student will be able to--

* Discuss the fundamental elements of interviewing.
* Assure effective interviewing of witnesses and people who may have intimate knowledge of the subject or the circumstances surrounding how the subject became lost.
* Use the lost person questionnaire form to structure interview.

"THE GOAL OF AN INTERVIEW IS TO PAINLESSLY OBTAIN INFORMATION FROM A PARTICIPANT IN OR WITNESS TO A TRYING INCIDENT IN ORDER TO DEVISE AN EFFECTIVE COURSE OF ACTION."

-TIM J. SETNICKA, WILDERNESS SEARCH AND RESCUE, 1980

Interviewing is the major tool for investigation

1.0 INTRODUCTION

1.1 Good interviewing is an art. It cannot be done effectively by everyone. Pre-planning is the key to assure that resource people capable of good interviewing are available.

1.2 Law enforcement agencies deal extensively with techniques of interviewing and often are a good source for resources to fulfill this function. However, INTERVIEWING is not INTERROGATION, and while in some instances interrogation may need to be employed, the Search Manager must be alert to the proper use of each.

1.3 Interviewing is a face to face conversation with a purpose -- to get information to save a life, recover a body or protect searchers. It is not a CROSS-EXAMINATION, nor is it TESTIMONY for a court case.

2.0 GENERAL PRINCIPLES

2.1 The interviewing of people with first-hand knowledge should take place as quickly as possible, while the information is still fresh and before collaboration with others can take place.

2.2 Always interview witnesses separately.
PITFALL

Do not assume that anyone is telling the truth or cooperating to the fullest extent.

1. There may be a crime involved.

2. A person may be suspicious or afraid of interviewer.

3. Rivalry, jealousy may exist between the lost subject and the witness.

4. Relatives especially may be embarrassed, about the subject’s condition or behavior.

5. The witness may not understand the complexity or seriousness of the situation or the relevance of particular information requested.

6. There is a natural tendency for family and friends to make the subject or themselves look as good as possible, by minimizing or ignoring faults, deficiencies, etc.

2.3 Always assume that everyone will have something to contribute if asked the right questions in the right way.

2.4 Be aware that some people are looking for publicity or to be the "center of attention."

2.5 Let the information lead to conclusions. The greater the amount of information, the stronger the validity of the conclusion. Conclusions sometimes must be (should be) made based on incomplete information. Good managers will be flexible and able to change conclusions and actions as information improves.

PITFALL

Beware of the trap of forming your conclusion, then gathering or interpreting information to support it.

2.6 Be aware that witnesses will have different interests, conclusions, biases and past experiences. These may influence their answers.

EXAMPLE: One person may be much more "tuned into" geographical features than clothing.
PITFALL

Do not assume that one person can give you all the information. And do not be too concerned about conflicting information. There will always be conflict. The differences must be evaluated and, when possible, the information VERIFIED.

3.0 THE PHYSICAL SETTING

3.1 The interview should be in an informal, relaxed, comfortable setting.

3.2 Should be private, free from interruptions.

4.0 TECHNIQUES FOR THE INTERVIEWER

4.1 If possible, interviewers should work in pairs while interviewing. This provides for two interpretations and evaluations. Reduces the chances of overlooking something.

4.2 Use a recorder if at all possible, particularly if working alone. Inform the witness of your intention to record.

PITFALL

Some people react negatively to recording, or "clam up." Be especially careful about writing down responses -- it may detract from what the witness says or you may be writing when you should be listening.

4.3 Introduce yourselves, explain--in detail--your purpose. Try to set the person at ease, relax them. You might start off with general conversation. Try to establish a good interpersonal relationship.
PITFALL

You may be dealing with a panicky person who may not be able to control his/her frame of mind. Statements such as "calm down" or "try to get control of yourself" rarely work. Start with general questions, or enlist his/her aid. You may need to ask him/her to go to a designated place and write down statements, etc., and come back later when more calm.

4.4 You must convey a sense of controlled urgency and concern, but not excitement, particularly if the witness is a relative, close friend, etc. Even if you feel the situation is not urgent, you must convey that you are taking action—doing the best possible.

4.5 Confirm identifying information about the witness for the record, and for future contact.

4.6 Try to understand the person and the mentality you are dealing with so that your questions will be appropriate. If you need to interview a child and you do not "relate" to kids, get someone who does.

NOTE: WITH CHILDREN, COMPENSATE FOR HEIGHT DIFFERENCE—GET AT EYE LEVEL WITH THEM.

PITFALL

We all have biases. We must recognize them when interviewing. If we do not like "long-hairs," chances are we will communicate that during an interview with one. It is easy to communicate disdain for the stupidity of a parent who let a small child wander away from a campsite. You must try to control these biases or allow someone else to conduct these interviews. You must be flexible and experiment. Sometimes a female interviewer might get more information from a male witness than a male, or vice versa.
4.7 **Ask "open-ended" questions** rather than leading ones that can be answered by yes or no.

**EXAMPLE:** "What did Tom have with him?" instead of "Did Tom have a knife and canteen with him?"

**EXAMPLE:** "On which trail did Mary go when she left camp?" is much more likely to get a "trail" response than, "Where did Mary go when she left camp?"

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**PITFALL**

You can "program" people to give erroneous responses by the way you ask the question. The question can contain information that reinforces the witness's conclusions, biases or heresay information the witness has heard. Questions must reinforce, not distort the MEMORY. People will want to appear knowledgeable and helpful. They can often sense the direction you are going and may tend to go along, even if they have few facts.

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4.8 **Be a good listener.** Ask the question, then LISTEN to the answer. Do not interrupt or begin to think ahead to the next question you want to ask. Wait until the answer is complete to clear up confusing points or to decide what you want to ask next.

4.9 **Do not be afraid to pause after an answer.** This gives you a chance to think, to digest the answer, and the "awkward silence" may prompt the witness to volunteer more information. Give no message to stop. Show acceptance, nod uh huh, yes... please continue etc.

4.10 As necessary, **paraphrase or summarize the answer** to make sure you understand the intent. "Did I hear you say...?"

4.11 You might **check validity by asking a question differently later**, or ask a question you know answers to.

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**PITFALL**

Be careful to try not to put the person on the DEFENSIVE.

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4.12 **Be alert to key words or phrases, particularly when repeated.**

4.13 **Be sure to explore each point fully** before going on to the next.
Avoid jumping around in the chronology of the incident. Generally follow the continuum of events, even if the witness may not know certain parts. However, one technique is to let the witness tell his or her entire story first, even if this involves jumping around. Then when you begin to ask questions, following the actual sequence of events, voids can be filled in, and some verification accomplished.

4.14 When you have run out of questions, ask, "Is there anything else that you think might help?" This may bring out something you have not thought of or give the person a chance to add something he or she thinks is important.

4.15 You might ask the witness what he or she thinks happened or what he or she thinks the subject did or will do. But this must be considered an OPINION and separated from facts.

How much do you play on the emotions of the witness? It is important to make each witness understand that the information he/she divulges (or withholds) could have a direct influence on the well-being or survival of the subject.

4.16 You may want to reduce the interview to a written statement—particularly if recording was possible. If so, inform the witness of any further action needed on his or her part.

4.17 At the conclusion, thank the witness. Reassure him or her that you are concerned and that the information has been helpful. This leaves the person with a good feeling. If the person felt "on the hot seat" at all, this may further break down some reluctance and generate some helpful "off the cuff" remarks.

4.18 If more than one interviewer is used, they must get together and compare information, reactions, "gut feelings," discrepancies, and missing information.

The command, planning and operations functions of the mission organization are hampered if the information derived, even though incomplete, is not constantly passed along to them.
5.0 WHO TO INTERVIEW

5.1 Among those who may have information critical to the outcome of the search are:

a. Companions who were with the subject.
b. Parents, wife, husband, children.
c. Other relatives.
d. Close friends
e. Co-workers.
f. Schoolmates, school counselors.
g. Family doctor.
h. Family clergyperson.
i. Business associates.
j. Local law enforcement officials.
k. Persons from appropriate banks, businesses, etc.
l. Persons from stores where equipment was obtained.
m. Other witnesses from search area who may have seen subject.
n. Persons who might have transported subject to or from the search area.
o. Family acquaintances, co-workers, etc. of the companions who were with the lost subject.
p. People who know the search area.

6.0 WHAT INFORMATION TO GET

6.1 Information needed generally is in one of two categories:

a. SEARCHING DATA - data needed by searchers to know where to look and who to look for.

b. PLANNING DATA - data needed by the manager to determine best strategy and tactics.

6.2 Elaboration of these data is the subject of a separate, specific chapter.

7.0 SPECIAL CONSIDERATIONS

7.1 Hypnotism has resulted in some success in obtaining information from witnesses who have difficulty with recall. Hypnotism should not be overlooked as a useful technique. Many law enforcement agencies now have people trained in hypnotism for this specific purpose.

7.2 The polygraph and other technological advances should not be overlooked as being useful in unusual situations.

7.3 If, at any time, information indicating the potential for criminal involvement is derived, individual rights, warnings and rules of evidence must be considered. Proper authorities, if not already involved, must be consulted before interviewing further.
USE YOUR LOST PERSON QUESTIONNAIRE FORM TO STRUCTURE INTERVIEW QUESTIONS.

The following is a checklist used at Yosemite National Park:

**INFORMATION ON SUBJECT - WHERE TO GET IT**

For an emergency rescue response, you will probably use only the first two of these. The others come in handy during searches.

<table>
<thead>
<tr>
<th>Direct from Reporting Party</th>
<th>Detain, hold on phone, get phone number, identification, location, auto, photos, maps, return to scene, where staying.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reconnaissance</td>
<td>Hasty Team, geographical viewpoints, loudhailer, hand signals, chopper, polaroid, backcountry (trail crew).</td>
</tr>
<tr>
<td>Auto</td>
<td>Returned?, equipment, notes, maps, leave note to &quot;call Ranger.&quot;</td>
</tr>
<tr>
<td>Accomodations</td>
<td>Returned?, equipment, notes, maps, leave note to &quot;call Ranger.&quot;</td>
</tr>
<tr>
<td>Home</td>
<td>Returned?, equipment, notes, maps, leave note to &quot;call Ranger.&quot;</td>
</tr>
<tr>
<td>Place of Work</td>
<td>Returned?, equipment, notes, maps, leave note to &quot;call Ranger.&quot;</td>
</tr>
<tr>
<td>Friends</td>
<td>Returned?, plans, physical &amp; mental condition, habits, drugs.</td>
</tr>
<tr>
<td>Relatives</td>
<td>Returned?, plans, physical &amp; mental condition, habits, drugs.</td>
</tr>
<tr>
<td>Co-Workers</td>
<td>Returned?, plans, physical &amp; mental condition, habits, drugs.</td>
</tr>
<tr>
<td>Registration Cards</td>
<td>Returned?, plans, experience, equipment, who to contact, etc.</td>
</tr>
<tr>
<td>Registration Cards</td>
<td>Of other parties who may have seen subject.</td>
</tr>
<tr>
<td>Wilderness Permits</td>
<td>Of other parties who may have seen subject, subject's plans, address, etc.</td>
</tr>
<tr>
<td>On-scene</td>
<td>Track, equipment.</td>
</tr>
<tr>
<td>Clues</td>
<td>Candy wrapper, dog scent articles.</td>
</tr>
<tr>
<td>Wanted</td>
<td>Mailed to wilderness permit holders in same area, at trailheads.</td>
</tr>
<tr>
<td>Posters</td>
<td>In stores.</td>
</tr>
<tr>
<td>Trailheads</td>
<td>Interview hikers.</td>
</tr>
<tr>
<td>Visitor Center</td>
<td>Interview staff, put up &quot;wanted&quot; poster.</td>
</tr>
<tr>
<td>Summit Registers</td>
<td>For subject, possible witnesses.</td>
</tr>
<tr>
<td>Bus Drivers, etc.</td>
<td>Let subject out where?, make announcement on bus.</td>
</tr>
<tr>
<td>Local Medical Facilities</td>
<td>Interview staff, local record check.</td>
</tr>
<tr>
<td>Local Law Enforcement</td>
<td>Separate the overdue from the emergency.</td>
</tr>
<tr>
<td>Campgrounds</td>
<td>Check registers, fee receipts.</td>
</tr>
<tr>
<td>Weather Records</td>
<td>Local and regional records.</td>
</tr>
</tbody>
</table>
INFORMATION ABOUT INCIDENT - WHERE TO GET IT

Here are some categories and specifics to look for when talking to witnesses. Not all of these are necessary for the initial response.

**What happened?**
Overdue, cries for help, crime, slipping, stuck, cold, thirsty, fallen, injured, dead, symptoms, walking wounded, equipment/personnel on scene, instructions by/to the subjects, reason for overdue.

**Where?**
Very important (show maps, photos to witness)
On ground, how far up/down, what climb, what pitch, in water, on bank, what trail, where last seen, headed which direction, landmarks, mileage, type of terrain, route taken before accident, afterwards, washed downstream, how long did witness take to get out, car parked, was he staying here.

**When?**
Last seen, supposed to return, injured, ran out of water, symptoms appeared, fresh tracks or old, did storm hit (match itinerary to the weather).

**Who?**
Name, age, sex, weight, etc., address, phone, parents, friends, condition (mental/physical), vehicle, skills, experience, personnel with subject, backcountry personnel in area, kind and size of shoes (sole), clothing types and equivalent and colors, complete list of equipment.

**Why?**
Family problems, drugs, avalanche, rockfall, illness (hypothermia)

ENVIRONMENTAL INFORMATION - WHERE TO GET IT

<table>
<thead>
<tr>
<th>Current weather forecast:</th>
<th>Can they spend the night? three day storm? lightning?  wet rock?  rising water?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marginal forecast:</td>
<td>Call County Sheriff upwind or flight service station.</td>
</tr>
<tr>
<td>Daylight:</td>
<td>See dawn/dusk tables in SAR manual or add 15 minutes (approximately) to sunset/sunrise in local paper.</td>
</tr>
<tr>
<td>Moonlight:</td>
<td>When will it rise, what phase, walk by, fly by.</td>
</tr>
<tr>
<td>Temperatures:</td>
<td>Usually much warmer on Valley Walls than on floor or rim.</td>
</tr>
<tr>
<td>Terrain for approach/evacuation:</td>
<td>Maps, photos, etc.  See &quot;Where to get it.&quot;</td>
</tr>
<tr>
<td>Picking lowering point:</td>
<td>Photos, reconnaissance, flares.</td>
</tr>
</tbody>
</table>
A relatively new area that has proven useful in limited applications for some categories of subject relates to personality, habits, likes/dislikes, etc., that may help classify and in turn limit the search area. (Also see Chapters on Planning Data/Searching Data and Subject Behavior) Questions may be directed at determining whether or not the missing subject is one of the following:

1. Adventurer - get to the summit at all cost, usually broken bones before reaching the age of maturity. Individual will take a steep slope or unusual obstacle.

2. Ponderer - not apt to jeopardize himself/herself, not likely to try new things, will wait for someone to bring it to him/her.

3. Drifter - (usually valid for under age 12) May be adventurer or ponderer as the mood suits him/her.

NOTES:
DETERMINING THE SEARCH URGENCY

OBJECTIVES: A student will be able to--

* Identify the factors involved in determining the urgency of the search situation.

* Describe how these factors help to determine the relative search priority and level of response.

The relative urgency of a reported situation should be established - if it is not immediately apparent - during the First Notice and Interview phase. Despite the need for a constant firehouse response to all reports of any kind, some latitude for flexibility exists and should be exercised."

- Tim J. Setnicka, WILDERNESS SEARCH AND RESCUE, 1980

1.0 FACTORS AFFECTING URGENCY

1.1 The following factors directly influence the well-being of the subject.

- Subject profile.
- Weather profile.
- Equipment available to subject (and the knowledge of how to use it).
- Subject’s experience.
- Terrain hazards.

1.2 The following factors have no direct influence on the subject, but do influence the decision-making process concerning the urgency of the situation.

a. History of Incidents in Area - the frequency of past incidents in the area and their outcomes can be a key in decision-making.

b. Time - the time elapsed from the moment the subject actually "went missing" is important in two respects:

- time frame for survival.
- effect of time on clues.

c. "Political" Sensitivity - the combination of all external influences will affect decision-making. Among these influences are:

- VIP involved?
- Interest of politicians.
- Pressure from relatives.
- Pressure from media: publicity.
- Pressure from higher in your organization.
2.0 **URGENCY CHART**

2.1 On the following chart, the lower the numerical rating of the factor, the higher that the *relative* urgency becomes.

<table>
<thead>
<tr>
<th><strong>Subject Profile</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>Very young.</td>
<td>1</td>
</tr>
<tr>
<td>Very old.</td>
<td>1</td>
</tr>
<tr>
<td>Other.</td>
<td>2-3</td>
</tr>
<tr>
<td><strong>Medical Condition</strong></td>
<td></td>
</tr>
<tr>
<td>Known or suspected injured or ill or mental problem.</td>
<td>1-2</td>
</tr>
<tr>
<td>Healthy.</td>
<td>3</td>
</tr>
<tr>
<td>Known fatality.</td>
<td>3</td>
</tr>
<tr>
<td><strong>Number of subjects</strong></td>
<td></td>
</tr>
<tr>
<td>One alone.</td>
<td>1</td>
</tr>
<tr>
<td>More than one (unless separation suspected).</td>
<td>2-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Subject Experience Profile</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Not experienced, does not know area.</td>
<td>1</td>
</tr>
<tr>
<td>Not experienced, know area.</td>
<td>1-2</td>
</tr>
<tr>
<td>Experienced, not familiar with area.</td>
<td>2</td>
</tr>
<tr>
<td>Experienced, knows area.</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Weather Profile</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Past and/or existing hazardous weather.</td>
<td>1</td>
</tr>
<tr>
<td>Predicted hazardous weather, (8 hrs. or less).</td>
<td>1-2</td>
</tr>
<tr>
<td>Predicted hazardous weather, (more than 8 hrs.).</td>
<td>2</td>
</tr>
<tr>
<td>No hazardous weather predicted.</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Equipment Profile</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate for environment and weather.</td>
<td>1</td>
</tr>
<tr>
<td>Questionable for environment and weather.</td>
<td>1-2</td>
</tr>
<tr>
<td>Adequate for environment and weather.</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Terrain/Hazards Profile</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Known hazardous terrain or other hazards.</td>
<td>1</td>
</tr>
<tr>
<td>Few or no hazards.</td>
<td>2-3</td>
</tr>
</tbody>
</table>
2.2 These factors should be used as an evaluative checklist. Doing so will assure that an influence that could be crucial to the well-being of the subject will not be overlooked. Viewed collectively, the factors provide an indication of the relative urgency for initiating a response, and how extensive the response should be. If you are not using a system like this, then what are you using.

"Whenever you set out to do something something else must be done first"

Over-reaction is justifiable... Under-reaction is inexcusable!

2.3 In addition, generally speaking, the more serious the previous incidents were, the more time that elapsed since the subject "went missing," and the more "politically" sensitive - the greater the urgency becomes.

2.4 The combination of the factors affecting urgency will help determine not only how quickly to respond, but the nature and level of response, as well. Some kind of response should always happen immediately - even if it is only an increase in planning for the higher potential that the problem will become more serious.

Some kind of response should always happen immediately.

SEARCH IS AN EMERGENCY
3.0 SUBJECT CONDITION ASSUMPTIONS

3.1 Usually, after assessing all the initial information obtained, the Search Manager makes an assumption as to the condition of the subject, in terms of his or her MOBILITY (ability to travel) and RESPONSIVENESS (ability and desire to respond to calls, etc.).
Four possibilities exist:

a. Mobile/responsive
b. Immobile/responsive
c. Mobile/unresponsive
d. Immobile/unresponsive

3.2 The assumption made about the subject's condition should help dictate the type of immediate searching action (tactics) to be taken.

4.0 SEARCH MANAGER MUST DECIDE

4.1 The factors and considerations in this chapter are tools to help the Search Manager make the most appropriate decision. In the end, the Search Manager's decision is still a subjective one, based on the collective information and assumptions, along with the safety of the searchers.
LOST PERSON BEHAVIOR

OBJECTIVES: A student will be able to--

* Determine that all facts may be important in predicting Lost Subject Behavior.

* Relate the significance of historical behavior data of persons in the particular geographic region that a search is being conducted.

* Identify those Lost Subject Behavior Factors which must be used in overall search strategy.

* Describe the need for data collection and its use in determining the most likely area to search.

References: Analysis of Lost Person Behavior, William Syrotuck.
"Summaries of NASAR Data Collection and Analysis", Barry Mitchell.

By analyzing the behavior of past lost persons in similiar situations, you might be able to "predict" what the subject you are now looking for might do, where he/she might go, or where he/she might be.

This concept is a search planning tool, dealing with generalities, and not absolutes.

1.0 GENERAL ASPECTS OF LOST PERSON BEHAVIOR --- Basic to any effective search is a profile of the individual that is being sought. A complete list of all information related to that individual specifically.

Example: The F.B.I.'s ten most wanted list

a. Physical description in great detail
b. Point last seen
c. Activities most likely to engage in, interests, hobbies, etc.
d. M.O. - Method of operation when committing a crime
e. Personality traits - aggressive, loner, dispondent, dangerous, etc.
All this information will help in some way to track down one of these criminals. Lost person incidents actually present the same problems confronting law enforcement officers in criminal investigation.

2.0 **FACTORS THAT ARE SPECIFIC TO LOST PERSON BEHAVIOR** --- Those that could effect search strategy.

2.1 **GENERAL STATE OF HEALTH:** Recent illness, poor physical condition, chronic disease, poor nutrition and lack of sleep all can impair a subject's ability to cope with unusual situations, especially physical stress. Fatigue usually sets in early and if the individual pushes onward, exhaustion will soon follow. The result is impaired physical and mental capabilities with the possibility of difficult detection by searchers in the area. Trip leaders often precipitate problems of this nature when they become ill just before an outing and go anyway. General health may give some indicator as to the subject's capabilities.

2.2 **PAST EXPERIENCES:** Previous experiences with challenging situations, strange environments or isolation will improve anyone's ability to deal with the problems brought on by injury, dis-orientation, or being lost. Studies reveal that those individuals who push out and expand their comfort zones (the sphere of everyday activities that a person feels comfortable with) more readily adapt to adverse situations and may prove to be less of a liability. People who rarely do or try anything new are likely to be more helpless and more of a survival risk.

2.3 **PHYSIOLOGICAL EFFECTS OF THE ENVIRONMENT:** Heat, cold, altitude and precipitation can all have adverse effects on the body and brain causing difficulty in problem-solving ability. Hypothermia (the lowering of the body core temperature) is still known to be the leading cause of death and accidents in the outdoors. During the advanced stages of both heat and cold exposure, individuals become irrational and beyond the ability for self help. Altitude drastically effects exhaustion rates and can be a major factor in unacclimatized persons. Precipitation can cause an individual to seek shelter and thus pose a problem with detectability, as well as an increased risk of hypothermia.

2.4 **BIOLOGICAL CYCLES:** This relatively new area of medical research is not fully understood but may have significant implications. Biological cycles of the body determine whether any person is in a "high" of being efficient and being able to cope or in a "low" characterized by bumbling and lethargy. Generally those experiencing a "low" may not be prone to effective self help. By contrast, those people experiencing a "high" may well perceive their predicament as a challenge and continue their efforts in all aspects of survival.
3.0 There are many things that a lost person might do that will affect both the search strategy and his/her own survivability. An awareness of these points may prove crucial in revamping a search plan at regular intervals.

3.1 The ability of the subject to build or seek shelter and get a fire started. Does the subject have the knowledge, skills, and/or resources to do these things? Campsites or fire circles will provide clues as the search progresses. Fires are also an extremely good signal of distress, while shelters in general, are good camouflages.

3.2 Discarding equipment or clothing is very typical of individuals in the latter stages of hypothermia or exhaustion. Although these items provide clues to the subject's whereabouts, they also point to a deteriorating condition with regard to the subject's ability to cope with the environment or situation.

3.3 Often an individual will develop an overwhelming sense of abandonment which results in a "do nothing attitude." They simply refuse to believe that anyone is out looking for them and as a result do not call or make signals of any kind. Some have gone so far as to ignore helicopters flying right overhead.

3.4 Whether or not a subject will be detectable is tremendously important to search planning. Visual detectability is generally thought of as being observable at fifty feet. The lost hunter who is dressed in bright clothing and able to respond is a great contrast to the young child who has been instructed not to speak or respond to strangers, and is dressed in dark clothing. Perhaps the child is huddled inside a log or stump to stay warm and dry. Despondents or mentally handicapped individuals can also present very difficult problems in detectability.

3.5 Travel aids provide avenues of little resistance for subjects and sometimes will be used extensively. Travel aids are pathways, old railroad beds, abandoned roads, game trails, streams, clearcuts, powerline rights-of-way or any area that provides a sense of direction and a path of little resistance. It is important to note that not all subjects will use travel aids even though they are available. For some reason, some prefer not to use them in their particular situations.

3.6 Weather and visibility play an important role in determining potential activities of a lost subject. Impending bad weather is obviously a threat to life, but perhaps a more immediate concern to the Search Manager is the fact that it may force the subject to stop and seek shelter. This has its positive affect as well as negative. If the subject is no longer mobile, SAR resources may have a chance for confinement. Visibility can have the same effect: that is, darkness or extreme foggy conditions can immobilize the subject. If the subject does move under these conditions, it will most likely be random wandering that could further complicate the search effort. Attractions such as roads or lights at night might not be effective.
4.0 **MENTAL IMPACT ON THE LOST PERSON** --- The human animal is social in nature with habits that develop into everyday routine. **Those who dwell in population centers or adjacent areas are dependent upon technology and modern conveniences for the necessities of life.** It appears that this dependency is increasing at a rapid rate. Is it any wonder that when separated from people, material possessions, or familiar reference points, many become very confused and disoriented, or at the very least, frightened?

![Image of a person running with a worried expression]

4.1 **Exactly how a person will react under stress when isolated and alone is unknown.** In an attempt to better predict a subject's actions, it is necessary to examine past accounts of subject behavior during actual search missions. After analyzing these missions, it becomes very apparent that a number of factors must be considered when developing an overall search strategy.

4.2 **The mental impact of being lost or disoriented varies among individuals but is generally characterized by a shock-like behavior and disbelief.** Contrary to popular belief, panic is seldom present. It appears that a complete loss of contact with known references results in feelings similar to vertigo (attitudinal disorientation such as experienced by pilots while flying). The subject often feels that the environment is closing in around him/her and there is an intense urge to run, break out, to find the trail or some familiar reference in that environment.

4.3 **After a period of time that varies with each individual, all subjects seem to get control of their emotions.** (This aspect is true of adults in various categories but not necessarily of children). Personal accounts relate how conflicts seem to develop between the conscious and subconscious minds about developing a plan of action appropriate for the situation. Eventually, a course of action that seems to offer the highest degree of probable survival, is decided on. This may or may not be a rationale or logical decision.
4.4 If the subject is overcome by a fear of some kind, it is possible that it may over-ride normal behavior and directly impact the outcome of the situation. Basic fears are always with us, and having fears is not abnormal. Everyone is afraid of the dark at some time because it masks one of our five senses. Fear of being alone, animals, suffering, death, and many others all are basic fears about the unknown. How will I react? What will it be like? The impact of these fears tends to be directly related to how well a person handles unknown or unexpected occurrences in daily life.

4.5 Many times there will be a fluctuation of thought from a sense of abandonment to a fear about what others will say when the situation is over.

a. What will all my friends or fellow employees say?

b. Who cares whether I am missing? -- Will they tell anyone?

c. Who is going to come out here and look? -- I will bet that they have not even started yet!

"Facts are stupid things until brought into connection with some general law" 

4.6 All of these factors may lead to poor judgement and irrational behavior. It is imperative to investigate a subject's personality, background, experience and recent mood in order to more accurately predict some type of behavior. Mental attitude is critical because despair and despondency may cause a subject to ignore or entirely disregard obvious aids to rescue.

5.0 The circumstances by which an individual became lost, and a thorough evaluation of the surrounding terrain are both important to establishing a search plan. In general, there are three major categories of circumstances to consider:

a. Known location - the individual was at a semi-familiar location such as a home, campground or playground, etc.

b. Enroute - the individual was traveling a route with one or more individuals and became separated.

c. No specific location - the individual is in a wilderness area or relatively inaccessible location.

5.1 Map and terrain analysis is useful in predicting subject behavior. Confusion factors on a trail, mazes, minor and major barriers, natural routes or travel aids and attractions should be identified and marked.
5.2 Compile a subject profile and update it regularly. Get key people together to go over all the "knowns" plus any accumulated "unknowns."

6.0 GENERAL CATEGORIES OF LOST PERSONS

The following are commonly used general categories of lost persons. Pertinent characteristics set each category apart. Although each of the groups exhibit specific traits, there are always exceptions, and good search strategy concentrates on the most likely. The exceptions may be useful in planning specific confinement techniques.

6.1 Children (1 to 3 years)

a. Unaware of the concept of being lost.
b. Navigational skills and sense of direction are practically non-existent.
c. They tend to wander aimlessly with no specific objective.
d. They might seek out the most convenient location to lay down and go to sleep:

✓ Inside a log.
✓ Under a thick bush.
✓ Under an overhanging rock.
✓ Under a picnic table.

"After careful and painstaking analysis of the sample, you are always told that it is the wrong sample and doesn't apply to the problem"  

6.2 Children (3 to 6 years)

a. These children are more mobile and capable of going further than those in the one to three year old category.
b. They have a concept of being lost and will generally try to return home or go back to someplace they are familiar with.
c. They have definite interests and may be drawn away by animals, following older children, or just exploring.
d. When tired, they generally will try to find a sleeping spot.
e. Many have been instructed to stay away from strangers and as a result will not answer or talk to searchers when called by name.
6.3 Children (6 to 12 years)

a. Their navigational and direction skills are much more developed.
b. They are generally oriented to their normal familiar surroundings and become confused in a strange environment.
c. They may intentionally run away to avoid punishment, gain attention, or sulk.
d. Whether it is intentional or accidental circumstances, they often will not answer when called.
e. Darkness usually brings on a willingness to accept help and be found.
f. Children this age suffer from the same fears and problems that adults would, but with a greater sense of helplessness.
g. The circumstances of loss often reflect their being transplanted into a foreign environment or surroundings by parents or other adults.

6.4 Elderly (above 65 years)

a. Often the person is suffering from senility or Alzheimer's disease.
b. They are easily attracted by something that strikes their fancy.
c. Their orientation is to past environments rather than the present.
d. Many pose the same supervision problems that children do.
e. The more active and lucid ones are likely to over-express and exhaust themselves rapidly which can result in heart attack or other potentially fatal complications.
f. They are often hard of hearing or deaf which present problems with detection.

6.5 Mentally Retarded (all ages)

a. They act and react much the same as children from the age of 6 to 12.
b. They generally will not respond to their spoken name.
c. They most often will be hidden from view as a result of fright or seeking shelter from the elements.
d. Many times they will hold up for days in the same location.
e. They really have no physical impairments except that they will do nothing to help themselves.

6.6 Despondents

a. Most often they are seeking solitude.
b. Generally they will not respond to searchers as they feel it is an intrusion on their solitude.
c. They will generally be within sight and sound of civilization.
d. They tend to be found near prominent locations:

✓ lake or scenic hill.
✓ lookout or area with a view.
✓ seldom, if ever, found in the underbrush.
6.7 Hikers

a. Generally, they will rely on trails with a set destination in mind.
b. Problems or complications usually arise with navigation when trail conditions change or become obscure:
   - slide over trail.
   - trail not maintained.
   - trail covered intermittently with snow in the spring.
   - poorly defined junctions.

c. Often hiking parties are mismatched in abilities and one person falls behind, becomes disoriented and ultimately lost.
d. Cutting switchbacks will many times lead to disorientation or going down the wrong hill or drainage.
e. They are very dependent on travel aids and trails for navigation.

6.8 Hunters

a. They tend to concentrate on game more than on navigation.
b. In the excitement of pursuing game, they are often lead into deadfall areas, boulder fields, underbrush, and deep snow with little regard for exhaustion or navigation.
c. They tend to over-expect themselves into darkness and push beyond their physical abilities.
d. They are typically unprepared for extremely foul weather. (Heavy storms in the fall often signify the movement of animals and consequently an improvement in hunting).

6.9 Cone pickers, berry pickers, mushroom pickers, rockhounds, photographers, etc.

a. Their intentions are to stay in one location.
b. They usually carry no provisions or survival gear.
c. They go in good weather and as a result do not wear anything but light clothing.
d. Because their attention is focused on or near the ground, they are often misled by subtle terrain changes.
e. Attempts to return to familiar ground only puts them further out of contact because of their complete disorientation.
f. These circumstances usually put them at a high risk for survival.

6.10 Fishermen

a. Generally, they are very well oriented because of the directional flow of a river or the position of a lake.
b. The reason they are overdue is most often accident related, such as slipping into the water, falls over cliffs trying to move up or down stream, or swept off of feet in fast moving water.
c. A very high percentage of this mission category is boat related.
d. Often this will be a recovery mission.
6.11 Climbers

a. The individuals in this category are generally well equipped and self sufficient.
b. They tend to remain on or near designated routes.
c. A primary factor for these incidents is weather or hazardous conditions which limit an individual's abilities.
d. Other major factors are falling debris and avalanche.
e. Technical expertise is generally needed for both search and recovery.

6.12 General information Relevant to the Prediction of Lost Subject Behavior -- The following is a summary of the major points that must be considered when trying to predict an individual's movements or whereabouts:

a. Category and circumstances of the loss:
   - Children are different from hikers, etc.
   - The elements of the loss contribute greatly in prediction.

b. Terrain:
   - Flat terrain generally yields different travel distances than hilly or mountainous.
   - The area should be examined for barriers, escape routes, confusing drainages or ridges, etc.

c. Weather:
   - Restricts the subject's movements.
   - Is a principle contributor to hypothermia.
   - Time criticalness of the situation may call for increased efforts.

d. Personality:
   - Consider the aggressive person versus the ponderer or pessimist.
   - Has a substantial effect on the person's ability to survive.

e. Physical Condition:
   - Are capabilities encumbered or not?
   - A poor condition means an increased susceptibility to environmental injury/illness, e.g. hypothermia, etc.
   - Has a direct bearing on the distance a subject will travel.

f. Medical Problems:
   - Anything that could possibly precipitate abnormal behavior.
   - Could have a direct bearing on the distance a subject could travel.
7.0 The information presented here is not going to be 100% right all the time.
It merely represents important facts which were pulled from previous case histories. These facts should provide you with tools to make the job of Search Manager less complex in the decision making process.

<table>
<thead>
<tr>
<th>SUBJECT BEHAVIOR: Evaluation of Circumstance of Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Known Location</td>
</tr>
<tr>
<td>1. Followed a road, pathway, or trail</td>
</tr>
<tr>
<td>2. Went cross-country</td>
</tr>
<tr>
<td>3. Went down a drainage or path of least resistance</td>
</tr>
<tr>
<td>4. Found in a hazardous area</td>
</tr>
<tr>
<td>En Route</td>
</tr>
<tr>
<td>1. Stayed on a path of trail (perhaps the wrong one)</td>
</tr>
<tr>
<td>2. Left the main trail:</td>
</tr>
<tr>
<td>a. Took a short-cut of any sort</td>
</tr>
<tr>
<td>b. Headed for sights or sounds of civilization</td>
</tr>
<tr>
<td>c. Became lost in heavy brush</td>
</tr>
<tr>
<td>3. Victim of hazardous areas</td>
</tr>
<tr>
<td>4. A medical problem near or on the trail</td>
</tr>
<tr>
<td>Wilderness</td>
</tr>
<tr>
<td>1. Found and stayed on travel aids (pathways, trails, etc.)</td>
</tr>
<tr>
<td>2. Remained in heavy brush or timber</td>
</tr>
<tr>
<td>3. Headed for the sights or sounds of civilization</td>
</tr>
<tr>
<td>4. Were victims of hazardous areas</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUBJECT BEHAVIOR DETECTABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easily Detected</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>Small Children</td>
</tr>
<tr>
<td>(1 - 6 years)</td>
</tr>
<tr>
<td>Children</td>
</tr>
<tr>
<td>(6 - 12 years)</td>
</tr>
<tr>
<td>Hunters</td>
</tr>
<tr>
<td>Hikers</td>
</tr>
<tr>
<td>Misc. outdoor</td>
</tr>
<tr>
<td>persons</td>
</tr>
<tr>
<td>Elderly</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUBJECT SURVIVABILITY (% perished)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weather:</td>
</tr>
<tr>
<td>Good</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Children</td>
</tr>
<tr>
<td>Adults</td>
</tr>
<tr>
<td>Elderly</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dead within: 1-Day</th>
<th>2-Days</th>
<th>3-Days</th>
<th>4-Days</th>
<th>More than 5-Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>50%</td>
<td>24%</td>
<td>9%</td>
<td>9%</td>
<td>8%</td>
</tr>
</tbody>
</table>

These three charts were extracted from: "Lost Persons Behavior", Bill Syrotuck, 1976.
### PROBABILITY ZONES (miles from point of last seen)

<table>
<thead>
<tr>
<th></th>
<th>Hill or Mountainous Terrain</th>
<th>Flat Terrain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Children 1-6 yrs.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.3 DN</td>
<td>.1 UP</td>
<td>.5 UP</td>
</tr>
<tr>
<td>.4 DN</td>
<td>.5 DN</td>
<td>1.4 DN</td>
</tr>
<tr>
<td><strong>Children</strong></td>
<td>1.6 DN</td>
<td>1.0 DN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.0 DN</td>
</tr>
<tr>
<td><strong>Elderly</strong></td>
<td>1.2 DN</td>
<td>.5 DN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.8 DN</td>
</tr>
</tbody>
</table>

### PROBABILITY ZONES cont. (miles from point of last seen)

<table>
<thead>
<tr>
<th></th>
<th>Hill or Mountainous Terrain</th>
<th>Flat Terrain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Hikers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.5 DN</td>
<td>2.0 DN</td>
<td>.6 DN</td>
</tr>
<tr>
<td>3.0 DN</td>
<td>3.6 DN</td>
<td>6.1 DN</td>
</tr>
<tr>
<td><strong>Hunters</strong></td>
<td>2.0 DN</td>
<td>1.8 DN</td>
</tr>
<tr>
<td></td>
<td>2.8 DN</td>
<td>3.1 DN</td>
</tr>
<tr>
<td><strong>Misc.</strong></td>
<td>1.6 DN</td>
<td>.6 DN</td>
</tr>
<tr>
<td></td>
<td>1.6 DN</td>
<td>3.1 DN</td>
</tr>
</tbody>
</table>
Hikers, in hill/mountainous terrain - 12-65 years old. Reason lost:
- 37% Disoriented.
- 20% Accidental and intentional separation.
  Poor or no map.
  Misjudge time, distance.

Other info: 46% followed a trail or path during some portion of their trek while lost/overdue.
- Drainages are an often-used path of travel.
- Significant numbers of persons wander about and go cross country.
- 43% were 'found by self' - that is, walked out on their own.
- 54% went downhill.
- 20% stayed on the same level.
- 25% went uphill.
- 34% were found within a mile of the last seen point.
- 90% of lost/overdue persons were moving for 24 hours or less - found within first 24 hours.
- 90% traveled less than 6 miles from the PLS (LKP)
- 2 miles/hour estimate is a reasonable speed for plotting theoretical search area.
- Those who travelled the greatest distance from the PLS also descended by roughly proportional amounts.

General

1. **Lost vs Overdue.** Lost means "psychologically lost", and overdue means "always knew the way but was late".
2. **Lost and Overdue Hikers:**
   - Tend to be young; good physical and mental condition, but in other ways not well prepared.
   - Usually lost because they became disoriented.
   - Usually overdue because they misjudge time or distance, errors made by the subject(s), not caused by external factors.
   - Most follow a path or drainage during a portion of their trip.
   - A large number wander about and go cross country.
   - A large percentage are communicative as opposed to unconscious.
   - Two-thirds are found within 2 miles of PLS or LKP.
   - 90% are moving less than 24 hours.
   - 33% travel at night.
   - About 50% are found by SAR effort, 40% show up without assistance.
   - 55% descend.

Hikers Lost and Overdue (501 Missions)

1. **Subject Age.**
   - Largely under 30 years old. 33% are 10-15 years old.

2. **Physical Condition, Mental Condition, Experience.**
   - Usually young, good physical and mental condition.
   - Not necessarily experienced.
   - Less than 20% were judged as having 'much' experience. Most judged as having 'little' experience.

3. **Subject Preparation.**
   - 40% are judged to be adequately equipped/clothed, 30% are questionable, 30% are inadequately equipped and clothed.

4. **Incident Cause.**
   - Human error, caused by subject.
   - Weather, darkness.

5. **Reason Lost.**
   - 40% disoriented, 25-30% misjudge time/distance.
   - Poor supervision, accidental separation, intentional separation.

6. **What they followed.**
   - 75% followed a trail or drainage at some time while missing.
7. Detectability.
   - Majority are 'communicative'.

8. Distance from PLS.
   - 82-90% are found within 5 miles of PLS.
   - 67% are found within 2 miles of PLS.
   - Typically, those who traveled more than 10 miles also descended
     several thousand feet, and followed trails as opposed to going cross
     country.

   - 92% moving less than 24 hours.
   - 30-40% traveled at night.

    - 40% found by hasty search.
    - Confinement/attraction instrumental in 17%.
    - 5% found by search dogs.
    - 3% found by line searchers.

Others Lost and Overdue (walkaways, campers, picnickers, mushroom pickers, other) 279 missions

1. Subject Age.
   - More missions for younger (under 8) and older (over 60).

2. Physical Condition, Mental Condition, Experience.
   - Generally in good physical condition.
   - 65-70% in good mental condition.

3. Subject Preparation.
   - 40-50% are adequately equipped.
   - 45-55% are properly clothed, 30% are questionably clothed, 15% are
     inappropriately clothed.

4. Incident Cause.
   - Human error, caused by the subject.

5. Reason Lost.
   - Disoriented, poor supervision, intentional separation.

6. What they followed.
   - Greater likelihood to wander about or go cross-country.
   - 50% followed a trail or drainage at some time while missing.

7. Detectability.
   - High percent are communicative.
8. Distance from PLS.
   - 69% found within two miles of PLS.
   - 90% found within five miles of PLS.
   - 33% found within 1/2 mile.

   - 90% are not moving more than 24 hours.
   - 30-50% move at night.

    - Found by a variety of techniques, no single technique emerged as "best".

Hunters Lost and Overdue (167 Missions)

1. Subject Age.
   - Generally 15-35 years old.

2. Physical Condition, Mental Condition, Experience.
   - 85% are in good physical condition.
   - Most in good mental condition.
   - One in three have "much experience"; most subjects have limited experience.

3. Subject Preparation.
   - Eastern U.S., 4 out of 5 are properly equipped and clothed. 50% never had survival training.
   - Colorado, most have survival training. 40% have adequate clothing and equipment. 40-50% have questionable equipment and clothing. 20% are inadequately equipped and clothed.

4. Incident Cause.
   - Human error; caused by the subject.
   - Weather a factor in 18% of cases; darkness a factor in one in every three cases.

5. Reason Lost.
   - Disoriented; misjudge time/distance; accidental and intentional separation.

6. What they followed.
   - Natural drainage, 39% of cases.
   - Significant numbers wander about and so cross-country (especially in the west).
   - Civilization and landmarks are not significant attractors.

7. Detectability.
   - High percent are communicative.
   - Significant percentages are mobile.
   - One in six wears dark clothing.
8. Distance from PLS.
   - 66% found within two miles.
   - California, 87% found within 5 miles.
   - Colorado, 78% found within 5 miles.
   - East U.S., 97% found within 4 miles.

   - 90% are not moving for more than 24 hours.
   - California and Colorado, 45% moved at night.
   - East U.S., 80% moved at night.

    - 25-60% found by SAR using attraction, confinement, hasty search, and helicopter search.
    - 25-45% found themselves.

Skiers Lost and Overdue (87 Cases)

1. Subject Age.
   - Generally under 35.

2. Physical Condition, Mental Condition, Experience.
   - Almost all are in good physical and mental condition.
   - One in three have "much experience"; significant numbers have "some experience".

3. Subject Preparation.
   - Generally well equipped and clothed.
   - 60% have survival training.
4. Incident Cause.
   - Human error; caused by the subject.
   - 33% weather; 20% darkness.

5. Reason Lost.
   - Disoriented (California); mishjudged time and distance (Colorado).
   - 30% intentional separation.
   - "Poor or no map" 20%.

6. What they followed.
   - Path or trail; drainages.
   - Attracted by civilization. 25%.

7. Detectability.
   - Almost all are communicative, 50% are mobile.

8. Distance from PLS.
   - 54% found within 2 miles.
   - 82-85% found within 5 miles.

   - 83% are not moving more than 24 hours.
   - 30-45% move at night.

10. How found (Search tactics).
    - 50% found by SAR effort using hasty search, visual tracking.
    - 50% find themselves.

Some Other Useful Information

1. Lost and Overdue Young Persons.
   - 93% are found within 2 miles from PLS.

2. Lost and Overdue Elderly.
   - 44% (California) traveled more than 4 miles.
   - 84% (East U.S.) traveled less than 2 miles.
LOST PERSON BEHAVIOR PROBLEMS

By: Bill Pierce

Referring to the information in this chapter and Bill Syrotuck's *Analysis of Lost Person Behavior*, make some "predictions" about the potential behavior of the following lost people. Include such items as: The potential distance they could travel, behavior characteristics expected, any strategy that you would use to find the subject.

Example: Kelty Southface, a 23 year old experienced backpacker, is one-day overdue from a 5-day hike in the Flatland Desert. Usual desert weather prevails, with temperature highs of 105 degrees and lows of 75 degrees. He was last seen at the burning bush, a local landmark, about 8 hours ago, in good health.

Answer: (a) 93% of lost hikers were found within 4 miles of the point last seen.
(b) 73% of lost hikers tend to use a path, trail, or stream, following the path of least resistance.
(c) The detectability of lost hikers in good weather is 75%.
(d) 89% of lost hikers tend to go downward.
(e) Check all trails and travel aids in the area.
(f) The relative urgency factor is low.

1. **Rocky Wallcrawler**, a 26-year old mountain climber, is 1-day overdue from a 3-day climb of Mt. Budweiser. He was last seen two-days ago at the 14,000 foot level with all his gear intact. The weather has been warm, dry, with temperatures in the 70's during the day, and in the 40's at night. The subject is in good health, experienced, with no medical or mental problems.

2. **Junior Rugrat**, a 5-year old boy, was last seen at 1900 hours at the 2,000 foot level on a ridge in the Appalachians. He is in good health. But, he has been lost twice before, and becomes disoriented easily. It is now 2100 hours, and it is raining. It is late April, and all the boy had on was a cotton shirt and cotton blue jeans.

3. **Grandpa Blue Berry**, a 78-year old berry picker, has been missing since 2100 hours and it is now 2400 hours. He was last seen at 1600 hours picking berries along a stream in mountainous terrain. He has a history of heart trouble and poor circulation. The weather is warm and mild.

4. **Pink Salmon**, an avid fisherwoman, is overdue from the trout tournament. She is 42 years old, and very experienced. She was last seen fishing the south side of Stoffel Lake at 1600 hours in very flat terrain. It started to snow at 1400 hours and there is now 2 inches of snow on the ground. It is now 1900 hours. She has no overnight gear, is in good health, but she had been very depressed lately.
5. **Stacey Temple**, a 7-year old active child in good health, was last seen at **0800 hours at a backcountry campsite.** She has a sleeping bag and some snack food. She is in mountainous country, and a heavy fog has set in. It is now 1600 hours.

6. **Macho Bearhunter**, 35-years old, was last seen pursuing a bear in a dense thicket at **1900 hours.** He is a diabetic and had not eaten since 0600. The weather is mild and dry. The terrain is hilly with dense vegetation. It is now 0800 hours the next day.

7. **Nordic Klister**, an 18-year old ski fanatic, was last seen at **Rocky Knob skiing across Wade Lake at 1800 hours yesterday.** It is now 1200 hours. He was dressed warmly, but had no overnight gear. The weather is calm and dry. The temperature was -10 degrees F. last night, and is currently +15 degrees F.

8. **Suzi Snowflake**, a 19-year old novice snowshoer, was last seen at **1500 hours on a steep slope on the Cascade Trail near Fear Gap.** She is in good health but cannot hear nor speak. It is now 2100, the weather is dry, with a 40 degree F. temperature. She has no additional equipment with her.
BEING LOST IS NOT DANGEROUS IN ITSELF...

IN FACT, with the proper mental attitude, it can really be interesting if time isn't critical and you are SELF-SUFFICIENT.

THINK OF BEING LOST as an opportunity to explore a new area.

THE DANGER IS IN LOSING SELF-CONTROL.

DANIEL BOONÉ said:
"I've never been lost, though I will admit to being confused for several weeks." (1)
INTRODUCTION TO THE THEORY OF SEARCH PROBABILITIES

OBJECTIVES: A student will be able to--

* Discuss the concept of "Probability of Success".
* Discuss why it is necessary to quantify or measure search efforts.
* Discuss the value of "numbers" (mathematics) "probabilities" and "equations" as search management tools.

Search Managers often assign some type of nonquantitative measure of success to their search effort.

Example: "The subject has most likely gone down Baja Creek. If I assign a team to check out that drainage, they will most likely spot him there. If I am right, we can start packing up because we will find the bugger in about an hour."

Without being aware of it, Search Managers are using probabilities. The statement could be reworded to say:

"There is an 80% probability that the subject has gone down Baja Creek, a 90% probability that the team will spot him, and therefore a 72% probability that we will be successful."

1.0 MODERN APPROACHES TO SEARCH THEORY

1.1 Involve:

✓ Scientific Methods.
✓ Mathematics.
✓ Computing Equipment.
✓ Common Sense.

\[ P_A \times P_D = P_S \]

"Only with the advance of modern technology have we learned to examine search in the light of science as an operation having various structural patterns and obeying laws of its own."

- B. Koopman

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2.0 PROBABILITY THEORY

2.1 Probability theory is a branch of mathematics with which a person may systematically deal with uncertain events. Appropriate implementation of the probability theory is an important tool for the Search Manager.

2.2 Specifically, the approach most useful to Search Managers involves the Bayesian Probability Method. Search Managers must attempt to assign realistic "apriori" (beforehand) probability distributions and try to check their validity or shift the probabilities as a result of new information.

2.3 In its simplest definition, the probability of any possible event (E) of a given sample space (the set of all possible outcomes from an experiment) is a number, P(E), that satisfies:

\[ 0 \leq P(E) \leq 1 \]

This means that the probability, P, of the event (E), has to be equal to or greater than 0, but less than or equal to 1. Probabilities can be expressed in decimal form (e.g., .46) or as a percent (e.g., 46%).

2.4 Applying this to search management means that a Search Manager must consider all possible outcomes to an action or decision and then select the outcome that has the highest probability of occurring.

Examples:

In any given defined portion (segment) of an entire search area, the lost subject, is in fact, either in that segment (probability = 1), or not in that segment (probability = 0). But when the probability that the subject is in one segment is compared with the probabilities that the subject is in any of several other segments, this possibility lies somewhere between 0 and 1 (or expressed as a percentage, somewhere between 0% and 100%).

Therefore, the Search Manager first must segment the entire search area into manageable (searchable) units. Then he/she must make an "apriori" assignment of the probabilities that the lost subject is in each of the segments. This process will be described in detail in the Chapter on Probabilities of Area.

Assuming that the lost subject is in a given segment, when any given method of searching that segment (considering type of resource doing the searching, the way they search, how many times they search the segment, etc.), is carried out, there is some probability (between 0 and 1) that this method will detect the lost subject. A number of factors affect whether the subject will be found or will be missed. Considerations involving how a segment is searched will be described in detail in the Chapter on Probabilities of Detection.
3.0 BASIC SEARCH PROBABILITY EQUATION

3.1 Basic equation: **POA X POD = POS.**

   a. **POS** represents Probability of successfully finding the subject or clue. (A measurement of a future action.)

   b. **POA** represents Probability of subject or clue being in the search area.

   c. **POD** represents Probability that the subject or clue will be detected by a search if it is in the search area.

3.2 **This equation is a very important planning tool for the Search Manager. It allows him/her to compare possible outcomes and select the best one, at any given time in the mission.**

"If there’s a 20% probability that the subject is in Segment A and I search it with a method that has a 50% probability of detection, I can assume my probability of success will be 10%. On the other hand, if there’s a 40% probability that the subject is in Segment B and I search it with a method that has a 60% probability of detection, my probability of success will be 24%.”

3.3 Note that **this equation is useful only as a planning (prediction) tool.**

As an expression of the actual result of a search, the Probability of Success derivation has no value. After a search has taken place, the subject was either not found (success = 0%) or was found (success = 100%).

On the other hand, the **POD value is a useful representation of the after-the-fact relative effectiveness of a search effort.**

4.0 **WHY DO YOU NEED PROBABILITIES?**

4.1 You must know how effective you have been, or can be, **in order to:**

   a. Distribute or redistribute resources.

   b. Search or re-search a search area segment; increase or decrease the size of a search area segment; expand the search area.

   c. Decide if or when to suspend an unsuccessful search.

   d. Rationalize your actions to the family, media, or higher authority.

   e. Potential defense in litigation.
5.0 THE CASE FOR QUALIFICATION

5.1 In one way or another we always evaluate our chances or our efforts. In many cases this has been done subjectively - using abstract words to state our evaluation.

<table>
<thead>
<tr>
<th>&quot;PROBABILITIES&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
</tr>
<tr>
<td>90%</td>
</tr>
<tr>
<td>80%</td>
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</tr>
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<tr>
<td>30%</td>
</tr>
<tr>
<td>20%</td>
</tr>
<tr>
<td>10%</td>
</tr>
<tr>
<td>0%</td>
</tr>
</tbody>
</table>

5.2 By using NUMBERS to express RELATIVE indications of probabilities, we can manipulate combinations of variables and CALCULATE results of alternatives.

- You cannot do this with words.

5.3 In using probabilities we must remember that they are like "playing the odds" or "trade-offs". The numbers are not to be thought of as absolutes. They are relative expressions.

In probability calculations, 70% by itself is meaningless. It must be thought of as being relatively better than 60%, but not as good as 80%.

5.4 We are a numbers-oriented society. In describing alternatives or actions, we can more easily grasp their meanings by using numerical comparisons.
ESTABLISHING THE SEARCH AREA

OBJECTIVES: A student will be able to--

* Describe the methods of establishing the search area in any lost person incident.

* Demonstrate the ability to establish a search area in a given map problem and relate its significance to search strategy.

CONCLUSION

Establishing the Search Area is the most crucial, critical step in preparing a search plan!

"By the very nature of search problems, the target's (subject's) present status is, at any time uncertain, and thus describable only probabilistically. Search theory has to do with the allocation of searching effort in such a way as to achieve some stated goal, usually presented in terms of producing an external value of some objective function."

- S.M. Pollock, University of Michigan

"In other words, if you know where the subject is, Go Get The Bugger!"
- Snowshoe Thompson, 1856

1.0 THE NEED TO ESTABLISH THE SEARCH AREA

1.1 The first step in an orderly approach to search strategy and tactics implementation is to decide where to look for the lost subject. Normally this involves a step-by-step process of applying known or presumed information that will lead to a logical conclusion about the defined boundaries of a piece of terrain - beyond which the lost subject is not likely to have travelled. In other words, drawing a line around a chunk of real estate.

1.2 The Relevance of the Last Known Position (LKP):
The last known position is the single most important point influencing the establishment of the search area. The LKP can be:

a. The Point Last Seen (PLS) - a point that some other person last physically saw the lost subject. The PLS, if directly associated with the area the subject is logically assumed to be in, can be a critical point in determining the search area. On the other hand, if the subject was last seen driving out of his driveway in Humptulips, Washington to hike in Mount Rainier National Park, the PLS is of little relevance.
b. **A departure point** - the location where the subject is assumed (corroborated by evidence) to have departed from en route to some (usually predetermined) destination. Examples:

- a trailhead
- a campsite
- the top of a ski lift

c. **A clue** - the location of a discovered clue that can be reasonably verified to be associated with the subject, and that, in a sequence of events over time, can be reasonably assumed to be the most recent event.

The importance of investigation and clue awareness is such that the LKP is likely to change as time marches forward during the search! With each successive update in the LKP, the search area should become smaller - meaning the search effort is getting closer to the subject.

1.3 **There are four methods of establishing the Search Area:**

1. **THEORETICAL:** Distance that the subject could have traveled in the time elapsed.
2. **STATISTICAL:** Data which reflects the distances other subjects have traveled given similar conditions.
3. **SUBJECTIVE:** Evaluation of the limiting factors that exist for the specific incident and geographic location. (terrestrial ground cover)
4. **DEDUCTIVE REASONING:** Methodical step by step analysis of circumstances surrounding the loss of the subject. Going from the general to the specific.

2.0 **THEORETICAL SEARCH AREA** - Basically this is a plotted line on the map indicating the maximum distance the subject could have traveled from the last known position (LKP) during the clapsed time.

2.1 When considering the probable actions of a lost subject, it is important to realize that an **individual theoretically can travel in any direction from the LKP**. The Search Manager initially must consider the total area (that of a circle) in which the subject may be located. For example:

- If a subject was capable of walking 1 mile in any direction from the last known position, the total area to be searched would encompass 3.1 square miles.

\[
\text{Theoretical Search Area} = \pi R^2
\]

\[
\text{Area} = 3.14 \times 1^2 = 3.1 \text{ miles}
\]

"You always seem to find something you lost in the last place that you look."
- Wade’s Theorem
If a subject was capable of traveling 2 or more miles from the point last seen, etc.:

\[
\begin{align*}
2 & \text{ miles; } 3.14 \times 2^2 = 12.6 \text{ square miles} \\
3 & \text{ miles; } 3.14 \times 3^2 = 28.3 \text{ square miles}
\end{align*}
\]

**What would be the theoretical search area for the following:**

<table>
<thead>
<tr>
<th>Miles</th>
<th>Search Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>50.24</td>
</tr>
<tr>
<td>5</td>
<td>78.5</td>
</tr>
<tr>
<td>6</td>
<td>113.04</td>
</tr>
<tr>
<td>7</td>
<td>113.04</td>
</tr>
<tr>
<td>8</td>
<td>200.96</td>
</tr>
<tr>
<td>9</td>
<td>254.34</td>
</tr>
<tr>
<td>10</td>
<td>314</td>
</tr>
<tr>
<td>20</td>
<td>1,256</td>
</tr>
</tbody>
</table>

2.2 Usually these distances are a function of determining distance traveled considering time, terrain and physical limitations. Factors influencing these distances relate directly to the missing subject's capabilities, the terrain and the time periods involved. (Remember, relatives and next-of-kin are often very poor judges of the subject's physical condition and stamina.)

"The first place to look for something is the last place you would expect to find it."

- Stoffel's Theorem (In an unsuccessful attempt to improve Wade's Theorem)

3.0 **STATISTICAL SEARCH AREA** - Statistical material derived from previous incidents can be extremely valuable in establishing a search area. Although they provide assistance, statistics are not absolutes and are always subject to exceptions. Case studies on the behavior of lost individuals have been collected for over 15 years in some areas of the country and have provided the basis for a great deal of useful search information.

3.1 **Uses of statistical data in establishing search area.**

a. Few individuals in our society are not affected in some way by statistics. Advertising uses them to sell products, the media impresses the public with tools like the Harris and Gallop Polls (nothing more than opinion figures).... we as a society thrive on statistics. Although useful in many ways, they often can be as misleading as meaningful.

b. In the area of search and rescue management, statistics relating to numbers and types of missions have long been used for budget justification, i.e., increasing numbers of missions of a certain type might well be justification for additional training and/or personnel and equipment.
c. In recent years, compilation of data and pertinent information from case histories of lost subjects have proved to be useful in establishing search area. The only major drawback in the use of this method seems to be the reluctance of many jurisdictions to keep accurate, meaningful SAR records.

3.2 Example use of case study data. **The relevance of median distance.**

a. "X county" begins to keep records on their lost hunter incidents over a given period. After several years, a simple linear plot of distances that hunters were found from the point last seen or last known position reveals something of significance. If used properly, this data can be a useful tool in establishing the search area.

Data Based on Lost Hunters in "X County" over a five-year period

![Diagram](image)

b. A simple analysis of this data reveals that there is a tendency for the hunters to be found around a point about 1.6 miles from the LKP. As a Search Manager looking for increased efficiency, this fact should influence establishment of the search area.

c. In applying statistical data, **two distances are extremely important to remember.**

1. **Distances from the point last seen or last known position to where subjects were actually found** - expressed in terms of straight line distances.

A subject may have walked 5 miles total distance but was found only 2.1 miles from the last known position.

Lost

Hiking
2. **Median distance** - the median distance within the entire range of case histories is that "middle point" distance at which there are an equal number of cases found further in distance as are found shorter in distance.

**NOTE:** The median distance is used because we usually are dealing with a small data set. The mean (average) distance would be better only if we had a large data set. In a small data set, the mean could be sharply skewed by one extreme case, thereby distorting our decision-making.

![Distance and found dots](image)

- Median = 4 miles
- Mean = 6.5 miles

"You can always find what you are not looking for."
- Brady's Theorem

3.3 **Establishing Zones of Probability**

a. If the statistical data from case histories are to be used to their fullest potential, it is important for the Search Manager to be able to visualize various zones in the projected search area and the odds of finding the subject there.

b. Disregarding all other factors at this time, we must assume that the subject could have traveled in any direction from the point last seen or last known position. Projecting the previous linear scale of case histories from "X County" map, we have the following representation:
c. The distribution of finds allows us to identify some useful measure of central tendency. Normally the distribution is not uniform (example 1); rather the dispersal tends to cluster around some point (example 2); the most significant point of central tendency for our data set, again, seems to be the median distance.

NOTE: It is important to note that the acceptable odds of success may vary with every individual and the circumstances. The probabilities which would be acceptable will directly affect the size of the area to be searched. Using these probabilities only serves as a tool for the search manager to make faster and more effective decisions.

d. According to the laws of probability, more lost subjects will be found closer to the median distance than any other point. For that reason, we must begin there. If a Search Manager wants to find the 25% zone of probability, (he/she would expect to be successful 4 out of 16 times) he draws 2 circles encompassing the four closest cases directly adjacent to the median distance. The last known position is the center of both circles. The zone between the circles would be the 25% zone of probability (POA).

NOTE: At this point we are not considering any other factors which would change these zones from 360 degree circles.
e. If the Search Manager determines that these odds (or probabilities) are not high enough then he must expand this zone to a point where the odds are acceptable with the time and circumstances of the situation. Example: If the Search Manager determines that a 50% zone is more desirable, (he/she would expect to be successful 8 out of 16 times, based on the case histories) then he must expand the zone by 4 more cases from his data base. The 75% zone would be expanded by 4 more or 12 out of 16 times, according to the data base, he would expect to be successful.

f. Wartes uses the term "probability density" to describe the probability that the lost person is in a defined area divided by the size of that area. As Search Managers, we are looking for the area with the greatest probability density to use as a tool in establishing our search area.

g. If the distribution of finds from our case histories was uniform, as in example 1 above, we would have just as much chance of finding the subject inside the circle bounded by the median distance as we would of finding the subject in the 50% annular region (band) within which 25% of the finds were just inside the median distance and the other 25% of the finds were just outside it.

h. If we calculated the areas of these two segments, we'd find that the circle has a smaller area than the annular ring. Therefore the probability density of the circle is higher than that of the annular ring.

i. However if the frequency distribution of finds is not uniform (a more likely occurrence) and there tends to be clustering about the median distance, then the width of the 50% band becomes narrower. Therefore the area typically may be smaller than that of a circle whose radius is equal to the median. Therefore it will have a correspondingly higher probability density.

NOTE: Even if the distribution was uniform, the median distance still may be a useful distance to plan the application of confinement tactics.

j. By analyzing the case history data, the Search Manager can use them as a tool for establishing the search area by defining an acceptable zone of probability. What is acceptable is up to the Search Manager (and the Search Management team). The following illustrations show zones for the 50% and 75% annular rings about the circle whose radius equals the median distance.
k. The Search Manager must realize that each time he/she tries to increase the odds of finding the subject, he/she must also deal with a larger area. Now we must consider other factors to limit these zones of probability to even more manageable search areas.

POA - Devising a probability distribution for a target's (lost person) location is an Art rather than a science. The procedure relies on the subjective judgement and experience of the search planner, aided by the facts available (i.e., last known position, intended route, terrain, etc.)

4.0 SUBJECTIVE CONSIDERATIONS INFLUENCING ESTABLISHING THE SEARCH AREA - Almost without fail, there will be a broad spectrum of subjective factors that will affect the establishment of the search area. Among them are:

- "Likely spots"
- Natural barriers and terrain features.
- Physical clues left by the subject.
- Historical data of the area from case histories.
- Gut feeling or intuition based on special circumstances.
- Physical and mental limitations of the subject.

Understandably, there are a number of drawbacks in weighing these factors. For the most part they are intangible and in the absence of agreement, one authority or personality may strongly influence the perception of probable area. However, when the last known position is not entirely relevant to the search area, consideration of these factors may prove invaluable.
4.1 Likely Spots - These are features or areas that, for one reason or another, take on a greater significance. They are usually features that offer some attraction to the lost person for:

- ease of movement.
- shelter.
- food or water.
- curiosity or companionship.

They may also be significant because they may offer better retention of clues. Some examples of "likely spots" are:

a. An unmarked path or trail.
b. A possible "short cut".
c. Abandoned or unused buildings.
d. Entrances to adits, mine workings.
e. Overheads and caves.
f. Berry patches and other possible sources of food.
g. Stream banks.
h. Any potential natural shelter from the elements.

Seasonal changes and weather changes may alter the significance of a particular likely spot or generate a different set of features of attraction.

An awareness, resulting from a proper briefing of the subject's likely behavior will have considerable influence on the identification of possible likely spots. The significance of any particular feature will depend on the strength of the feature in the field in relation to the behavioral profile of the lost person.

Likely spots will only have relevance and, therefore, value if they are recognized and acted upon. There will be occasions when opinion in a field search party will vary as to the significance or even existence of a particular likely spot. The more people in the search party who see and agree on a particular likely spot, the stronger will that feature be in relation to the field decision to invest the time to divert and investigate.

Likely spots are of conceptual significance to Search Managers, and of real practical importance to every member of the field search teams. Search Managers should understand the concept and importance of likely spots. When briefing teams, a short discussion on likely spots should be included. The members of a search team should be reminded of the likely spot concept and told to:

- Look for them.
- Mark them on their maps.
- Investigate them whenever possible.
- Discuss them at the debriefing session.
The real development in the identification and use of likely spots is in the field. It should become part of the basic training for all field search personnel. The concept can also be used to develop that essential curiosity and continuing inquisitiveness that is an absolute prerequisite of any search party.

Whatever the type of search pattern being used it is important that likely spots be looked for and investigated at the time that they are first identified. The fact that it may be necessary to depart from a predetermined search pattern should not be used as an excuse to bypass, ignore or forget a good feature of attraction. Any likely spot identified by any member of a search team should be noted and reported at the very least. It may not be practical to investigate every single likely spot immediately, however each one identified will need to be looked at, maybe by another team. It is suggested that the stronger likely spots be looked at immediately, with the less robust ones recorded for possible future investigation. It must be stressed that throughout training and on operational work that the first ingredient absolutely essential for high quality search work is sound judgement. More than anything, successful use of the likely spots the concept depends upon good field judgement.

4.2 Natural barriers and terrain features. - These factors are those natural terrain features which may have influenced the direction of travel the subject may have chosen, both positively and negatively. Cliffs, rivers, dense vegetation, clearcuts or open powerline trails, switchback shortcuts, steep terrain, confluence of drainages, visual incentives, old roads or railroad beds, etc.

4.3 Physical clues left by the subject. - Physical clues or evidence that proves conclusively that the subject has been in a specific location.

NOTE: As physical clues or evidence are discovered, (i.e., footprints known to be the subject's, articles of clothing or equipment, eyewitness accounts), the last known position must be moved, if appropriate. This in itself could change an entire strategy being used by the Search Manager.

Clue examples: Footprints (known to be subject's).
Clothing.
Equipment.
Wrappers - cigarette, candy.
Eyewitness reports.
Campsites, etc.

4.4 Historical data. - Information from the local case histories often indicates that subjects lost or overdue in a specific area tend to do the same thing again and again. A good example of this can be found in many areas where drainages tend to funnel lost subjects into definite locations, (i.e., roads, river bottoms, or canyons).
4.5 **Intuition or gut feelings ("visceral override").** - Well experienced Search Managers develop a sense of "intuition" or "sixth sense" about the circumstances that lead up to a lost person incident. This is not to say these individuals are always correct but experience provides a great deal of insight into these types of situations. Analyses of all other subjective factors may influence this aspect.

4.6 **Physical and mental limitations of the subject.** - Examples:

1. Adults in general can travel further than young children.
2. Handicapped individuals will be restricted in rough terrain.
3. Physiological effects of medication or lack of medication may restrict a subject’s ability to move.
4. Retarded individuals may exhibit no clear-cut objective in their movements, (i.e., wandering aimlessly).
5. Slick-soled, low quarter shoes in rough terrain could limit travel.

NOTE: Again, friends and relatives will characteristically over-estimate or under-estimate the capabilities of a subject. Third party subjective evaluations, if possible to obtain, are often more valuable.

Examples: A camp counselor’s evaluation of a child’s capabilities. A nurse’s evaluation of a senior citizen from a convalescent home.

5.0 **DEDUCTIVE REASONING** - This is the process of reasoning in which the Search Manager looks at general facts and circumstantial evidence and logically deduces probable conclusions that are not obvious or were not known initially. Sir Arthur Conan Doyle’s character *Sherlock Holmes* was well known for his deductive reasoning powers.

**SEARCH IS THE "CLASSIC MYSTERY"**

5.1 **Example Situation:** A car is found parked on a small turnout of a secondary road in Mt. Rainier National Park. It has been parked there several days. Known facts:

- There is no trailhead at that location.
- There is no view of the mountain at that location.
- Registration check of auto: registered to an Airman at McChord, A.F.B.
- McChord A.F.B. says the Airman is overdue from a 3-day pass.
- Preliminary search of the surrounding area reveals no clues or additional information.
- Terrain is timbered and turnout is at the base of a small canyon.
- Search of the locked car reveals the following articles:
  
  . one (1) pair of low quarter shoes
  . empty film box
More extensive searching in the area revealed no leads or clues. It was deduced that the Airmann had probably changed shoes (more than likely into boots for climbing). The empty film box was an indication that he had a camera with him. Since there is no view of the mountain readily available from that point, it was thought he might be looking for a unique or unusual view to photograph. One of the searchers took this line of reasoning and then tried to project himself into the missing subject’s place. "Where would I go if I wanted a unique, unusual or strikingly beautiful photograph if I were starting from this turnout?"

Subsequent searching up the canyon revealed that the subject had climbed to a location and had fallen from a high cliff.

"Imagination is sometimes more important than intelligence"

NEVER, NEVER, SEARCH PLAN BY YOURSELF

6.0 SUMMARY - Using any or all logical combinations of these methods, the Search Manager must assure that there exists a defined search area (usually in the form of a map with a line drawn around a piece of real estate). Having done this, the next step is to segment the search area into units that can be searched with reasonable ease.

7.0 AN EXAMPLE: PUTTING IT ALL TOGETHER

At 4:30 p.m. on Sunday afternoon, a six-year old boy is reported missing from the Rock River Campground. You are the responding officer. It is early fall and weather has started to turn cold with increasing rains. (A potential time critical situation). The parents state that it has been a little over an hour since they have seen their son, and the searching efforts they initially tried turned up nothing. A last known position is identified and marked.

7.1 Interviewing the parents while waiting for SAR resources to arrive reveals the following:

a. Boy is a mature 6.
b. Adventurous and has been in the outdoors many times.
c. Loves animals and is fascinated by wildlife.
d. Lightly dressed for warm days.
e. Has been instructed not to play near the large Rock River without an adult.
f. Spent a great deal of time at the campground playing in the small tributary stream that goes through the area and flows into the river.

7.2 At 5:30, six hasty team members arrive with information that twelve more volunteers will arrive at approximately 9:00 p.m. There is approximately one hour of daylight left and a light rain is beginning to fall.
7.3 Initially a Search Manager must assume the subject could have traveled any direction from the last known position in a 360 degree circle. How far the subject travels gives the first potential area to deal with in terms of theoretical potential area.

\[ 2 \times \pi = \text{AREA} \]

7.4 If it was felt that subject could have covered 2 miles in the time-period elapsed, that would be a theoretical area of 12.6 square miles.

\[ (2) \times 3.14 = 12.6 \text{ square miles} \]

7.5 After consulting the historical data base, (Bill Syrotuck's Analysis of Lost Person Behavior), it was determined that the majority of subjects were found between .7 miles and 2 miles, the median being 1.2 miles. (Field Coordinator's Guide under Flat Terrain)

NOTE: If a local data base is available and it differs from Syrotuck's figures, then by all means use the information that is pertinent to your area. Any analysis of previous mission activities can be productive. Especially, distances found from the last known position by category of subject.

Further, consult the information contained in the "Lost Person Behavior" chapter in this manual. It would be wise to plot both Syrotuck's and Mitchel's conclusions, plus any local data base on your search planning map. After all, you do not know where the subject is. Any of the studies could be right. So plot them all, and send teams to all locations.
7.6 It is obvious that with the time constraints and available resources, it would be impossible to consider the entire theoretical or statistically probable area initially. **With subjective evaluation the area of highest probability can quickly be reduced to a more realistic and manageable size.**

7.7 Although not entirely to be discounted, the river forms a very substantial barrier on one side of the campground. The cliffs form another barrier that he would not likely be able to climb. The road borders the river and the area around the lake is fairly open and flat. This cuts the size of the "search area pie" down substantially. Last known position is checked thoroughly and a direction of travel (through footprints) indicates the area of the small stream is a highly probable search area.

a. Whether by past experience or local visual clues, this process of dividing up the probable search area should become second nature.

b. Remember, not only are we trying to identify areas where the missing subject might be, but also potential areas that we are relatively certain that he or she is not in.

---

**Search Manager:**

1. Determine an acceptable POA (size and boundaries).
2. Segment the area (high potential as well as low).
3. Determine a desired POD (within manpower and time limits).

---

**WHY DO WE SEARCH?**

LEGAL - MORAL - HUMANITARIAN - CURIOSITY?
7.8 Through deductive reasoning it may be possible to further narrow the possibilities. Specific activities at the creek while playing could give a lead to pursue. If the youngster was fascinated with animals, perhaps the heavy presence of beaver in the area might have some bearing on his activities. Locations or trails where they would be prevalent might further limit the possibilities. Has the boy wandered off before? Did the family take any hikes in area? Clues or subtle hints could prove crucial.

7.9 The next map represents those areas that have been identified as high potential based on interviews, subject profile, last known activities, and terrain evaluation. This information coupled with data base distances from Syrotuck, Mitchell, or local history can be extremely helpful in deploying limited first response resources to the field.

Search Theory - deals with allocating searching effort, given target information and a criterion.
SUBJECTIVE METHOD
NOT CONSIDERED PROBABLE IN INITIAL EVALUATION
NEVER COMPLETELY DISCOUNT ANY AREA

THEORETICAL
ESTIMATED OUTER BOUNDARY OF AREA THAT SUBJECT COULD HAVE REACHED IN THE TIME FRAME GIVEN

SUBJECTIVE METHOD
NOT CONSIDERED PROBABLE INITIAL EVALUATION
NEVER COMPLETELY DISCOUNT ANY AREA
References:


Bownds, Dr. John; personal communications with the authors.

Jones, Dr. A.S.G.; "Likely Spots", unpublished paper.

NOTES:

\[
\text{Probability of Success} = P_s = P_A \times P_D
\]

\[
P_A \times P_D = P_s
\]
CONFINEMENT: TACTICS TO LIMIT THE AREA OF SEARCH

OBJECTIVES: A student will be able to:

* Describe methods for confining a search area.

1.0 WHY LIMIT THE SEARCH AREA?

The smaller the area that must be searched, the less time that will be required to effectively cover it. In addition, the numbers of searchers required will be less and THE CHANCE OF RAPID SUBJECT RECOVERY ARE GOOD. With limited resources, the efficient Search Manager really has no other viable alternative.

2.0 CONFINEMENT - AN INITIAL TACTIC USED TO LIMIT THE PROBABILITY OF AREA.

2.1 It is imperative that an effort be made to establish a search area with specific boundaries beyond which the missing subject has not passed.

A SEARCH AREA WITHOUT A MISSING SUBJECT IS NONSENSE

Once the search area has been defined, numerous methods can be employed to ensure detection should the subject pass through the perimeter.

2.2 If the subject is presumed to be mobile, this procedure requires prompt initial reaction combined with an accurate assessment or analysis of the surrounding terrain. Rapid confinement presents no conflict with other search methods and dramatically reduces the chance of an expanded massive search area.

CONFINEMENT IS NOT POSSIBLE IN ALL CASES

2.3 Confinement:

✓ Doesn't conflict with active search methods.
✓ Starts at the perimeter.
✓ Decreases the chances of a massive search.
✓ Requires prompt initial reaction.

Confinement - An effort to establish a search perimeter which encompasses the subject and beyond which he/she is unlikely to pass without being detected.
3.0 CONFINEMENT METHODS

**Road Block, Trail Block, Camp-ins** - Any roads or clear pathways provided routes by which a subject can depart an area. Many subjects have walked out on a road, caught a ride with the first vehicle contacted and completely left the area. Establish road blocks and patrols on all roads leading into and out of the confinement perimeter. In the case of wilderness areas, both trail blocks, patrols, and camp-ins (in a specified drainage) will serve to identify and preserve perimeter boundaries.

**Look-outs.** - Where existing National Forest and Park Service look-out stations exist, notify these sites of the missing subject and ask for observation assistance. In many cases look-outs have been replaced with aircraft overflights. Specific posting of individuals in strategic locations on high ground is also a viable method of establishing perimeter.
Track Traps - A method used for many years by the U.S. Border Patrol is the placing of track traps. This involves brushing off bare areas, dragging road edges, or lightly traveled back roads. The intent is to frequently check for footprints in the brushed areas for an indication that the subject has moved through the perimeter.

String Lines - An ingenious method of confinement has also been developed by the Explorer Search and Rescue (ESAR) Organization. Spools of string are mounted in a backpack. As the search team member carrying the pack walks through an area, the string unrolls leaving a very visible trail. Other ESAR members following along tie the string waist high on brush, etc. and place paper arrows on the string pointing toward a road or base camp. It is assumed that the subject will follow the arrows, or at the very least, the string will serve as a visible perimeter.
SEARCH STRATEGY - SEARCH AREA SEGMENTATION

OBJECTIVES: A student will be able to--

- List reasons for segmenting the search area.
- Describe the process used for segmenting the search area.

1.0 WHY SEGMENT THE SEARCH AREA?

Search area segmentation is a very important activity in search strategy. It is designed to:

✔ Assure complete coverage.
✔ Complete shift objectives in a reasonable time.
✔ Reduce effort by searchers.

2.0 THE CONSTRUCTION AND USE OF SEARCH SEGMENTS

There comes a stage in the development of a search when many, if not all, the preliminary steps have been undertaken, hunches played and the subject has not been found. It now becomes desirable to divide the search area into segments for detailed searching. The purpose of dividing the area into segments is to reduce the total area into manageable units that may be adequately controlled by the Search Manager and worked by the search teams.

2.1 Consider All Information:

The construction of search segments provides an opportunity to reconsider all the information available at this stage of the operation. The factors that should be considered or reconsidered are:

1) All the information on the victim (subject profile).
2) What has already been accomplished.
3) What clues have been reported and the reliability of the clues.
4) Detailed terrain analysis of the search area:
   a) Complexity of the ground.
   b) Density of vegetation.
   c) Difficulty for the searchers.
5) Resources available, i.e. size, type and quality of teams that can be put into the field.
6) Access to search areas and available transportation.
7) Current and predicted weather.
2.2 Defining Segment Boundaries:

The drawing of segment boundaries requires careful thought, good map reading and, ideally, a knowledge of the region. The use of imaginary or mythical lines such as latitude and longitude, National Grid, UMS or UTM lines is valueless. The searchers in the field seldom have the time and very few have the ability to use these lines as identifiable boundaries. The choice of boundaries must be based on what can be seen and readily identified in the field by all the searchers. The following features may provide suitable boundaries:

**Manmade:** Fences, roads, ditches, power lines, trails, firebreaks, survey/boundary lines, railroad tracks, walls.

**Natural:** Ridge lines, canyon bottoms, rivers, streams, creeks, topographic breaks, vegetation breaks, geomorphological features (boulder fields, scree slopes, cliffed areas).

**Improvised:** Compass lines (stringed or flagged), point-to-point (line of sight).

**NOTE:** Keep strings or flags in place for the next shift.

To obtain complete coverage you must have:

- A well defined segment, one with clear boundaries.
- An easily mapped segment.
- An easily located segment.

In flat areas of few discernable features it will be necessary to mark one's own boundaries. This is often done using flagging (e.g., biodegradable toilet paper) or string lines along compass lines. Where possible these should be put in ahead of the search teams.

In some cases boundaries will be unavoidably vague. In these cases it is better that there is some duplication of coverage over the boundaries rather than gaps or strips left unsearched.

2.3 How Large Should They Be?

Terrain and cover are the major aspects that dictate size. A reasonable size is a segment that can be covered by a search team in 4-6 hours (1/2 shift). This allows the team to complete the assignment, have a break and be shifted to another segment. The team feels a sense of accomplishment in finishing the objective. High probability segments can be covered while the subject might still be responsive. Larger segments might not be completed.
Large segments are:
- Bad for morale.
- Hard to pick-up on next shift.
- Subject might be missed.
- Delays plans implementation.

Segments that are too small can cause logistics problems:
- Have to move teams too often.

To reduce effort by searchers, you should:

✓ Avoid interior barriers. It is not effective to have units crossing and recrossing fences, creeks, highways, ledges, etc.

✓ Consider which resource is most appropriate to each segment (e.g., mountain rescue for cliffs; helicopters for open areas; dogs for heavy cover).

✓ Consider starting searchers (transporting them to) higher points. It is easier to search diagonally downhill.

✓ Save energy and time with prearranged rides back to camp or to next segment.

Consider the problems of coverage along segment boundaries. It is easy to leave gaps on rounded ridges, canyon bottoms, along creeks, etc. Searchers assume that the adjacent crew got it.

3.0 As the boundaries are identified and drawn in, the segments are numbered. Numbering the segments ensures conformity, makes identification and, therefore, communications easier. On occasions it may prove desirable to sub-divide segments which may then be lettered. If all teams have copies of the segment map, redirection or retasking becomes a relatively simple matter.

4.0 Once the segments have been drawn on the master map at Base Camp, copies should be prepared for handing out to the Team Leaders when they are briefed for the field work. Not only should a Team Leader be given a copy or copies of the segment map but also, as far as possible, the area and boundaries should be described during the briefing. He/she should know who is in adjacent segment and their radio call-signs. Ideally, copies should be produced on transparent paper so that the Team Leader can lay the segment sheet on his/her own map.

5.0 It should go without saying that everyone involved in the search must use the same map or set of maps. Proper topographical maps must be used. The scale of the map will depend on the size of the search area, the amount of detail required and, of course, what is available in sufficient quantities for the scale of the operation. Wilderness guides, outline maps and other such cartoons are a nuisance. Many have no consistent system of gridding the map and, therefore, can not be used for an accurate position fix or concise description of location.
6.0 At Base Camp the segment map should be covered by a transparent overlay on which all pertinent information can be recorded for each shift. Teams returning from the field should be thoroughly debriefed; their information summarized and added to the overlay on the master map. This map now provides a concise record of what has been done, together with the estimates of coverage and identifies any weakness or gaps, on a shift by shift basis.

7.0 Generally it is best to determine search segments as they are required for each search. In some areas it may be possible or, indeed, desirable to pre-determine search segments. Transparent overlays could then be printed and stored ready for use.

NOTE: With the maps that you normally use during a search, identify how much area constitutes a 160 acre plot. Several different sizes and shapes could be established and transferred to transparent acetate templates for use during your next search mission.

Some Useful Data and Considerations:

Terrain and Ground Cover dictate size.

- 100 to 250 acres is usual size for 1/2 day.
- 160 acres with non-thorough (100') gridding takes 10-12 searchers about 4 hours.
- 160 acres takes a dog team 2 to 6 hours.

NOTE: suspect any team that gets done in half the time.

Information Supplied by Hatch Graham.
SEARCH STRATEGY - ASSIGNING THE PROBABILITIES OF AREA (POA)

OBJECTIVES: A student will be able to--

* Describe the consensus approach of assigning probabilities to search area segments.

1.0 ASSIGNING PROBABILITIES TO THE SEGMENTS

Each defined segment should have a value assigned to it that represents the probability (POA) that the subject is in that segment. In effect, this process ranks the segments in the order of priority that each should be searched and with what response.

1.1 The Consensus (Mattson) Approach. The best approach to assigning the probabilities to segments is to use the consensus method, sometimes referred to as the Mattson method (after Bob Mattson, USAF (ret.), who applied the concept to search management). The steps are:

a. The principle members of the search planning or management team individually and independently assign values to each segment. The total of each person's "points" must add up to 100. (In theory, no segment should get a 0 value. If there was agreement about establishing the search area, there is some chance the subject is in every segment).

NOTE: In addition to each defined segment, the "all other" must also be considered a segment (to reflect the probability that the subject is not in the search area at all). See paper: "Applying Shifting Probabilities of Area (POA) in Open System Searching: A New Concept in Search Management," at the end of this section.

b. After each evaluator has assigned values, the total values for each segment are averaged. The results represent the POA for each segment.

c. The following example refers to the search area depicted on the following page:
# PROBABILITY EVALUATION OF SEARCH SEGMENTS

## SEGMENT

<table>
<thead>
<tr>
<th>Evaluator</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>*E</th>
<th>**TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>LaValla</td>
<td>25%</td>
<td>25%</td>
<td>20%</td>
<td>25%</td>
<td>5%</td>
<td>100%</td>
</tr>
<tr>
<td>Wade</td>
<td>70%</td>
<td>5%</td>
<td>10%</td>
<td>10%</td>
<td>5%</td>
<td>100%</td>
</tr>
<tr>
<td>Brady</td>
<td>45%</td>
<td>35%</td>
<td>8%</td>
<td>10%</td>
<td>2%</td>
<td>100%</td>
</tr>
<tr>
<td>Stoffel</td>
<td>60%</td>
<td>20%</td>
<td>10%</td>
<td>8%</td>
<td>2%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>200%</td>
<td>85%</td>
<td>48%</td>
<td>53%</td>
<td>14%</td>
<td></td>
</tr>
<tr>
<td>Divided By:</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>AVERAGE</td>
<td>50%</td>
<td>21.2%</td>
<td>12%</td>
<td>13.3%</td>
<td>3.5%</td>
<td>100%</td>
</tr>
</tbody>
</table>

* = THE "ALL OTHER" SEGMENT

** (Each evaluator's lines must total 100%)

---

**REMEMBER, YOU NEVER, NEVER SEARCH PLAN BY YOURSELF !**

DON'T EVEN THINK ABOUT DOING IT BY YOURSELF. USE THE BEST MINDS AVAILABLE. ANYBODY'S GUESS COULD BE THE RIGHT ONE.

ONLY FLAMING ASSHOLES SEARCH PLAN BY THEMSELVES.

- Snowshoe Thompson, 1856.
APPLYING SHIFTING PROBABILITIES OF AREA (POA) IN OPEN SYSTEM SEARCHING: 
A NEW CONCEPT IN SEARCH MANAGEMENT

BY

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Assistant Superintendent  
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Pennsylvania

February 1983
INTRODUCTION

A Managing the Search Function (M.S.F.) Instructor Workshop was held in December 1982 at Albright Training Center. Participants were exposed to several new concepts involving the mathematical aspects of search management.

This paper outlines those concepts and offers them as alternatives to current search management theory. Those who instruct the course, Managing the Search Function, or use the principles taught in the course to manage searches should find them most valuable.

In addition, search managers should add these concepts to their "tool chest." Search management is not an exact science. But certain mathematical principles have been of great value in finding lost persons. Professional search managers need to view new ideas with an open mind. Read this paper in that light. The concepts presented here improve upon what is now considered "state of the art", and will allow expertise and limited resources to be used more effectively.

The search community is indebted to Dr. John Bownds, Associate Professor of Mathematics at the University of Arizona for his input and review of this paper. Without his interest and counsel, these concepts may never have been applied to search management.

Purpose

The purpose of this paper is to introduce new applications of concepts relating to search management. The use of the formula for probability of success (POS) will be discussed in contrast to the concept of probability of area (POA). Distribution and shifting POA's, in "closed" and "open" search systems will be compared. A different formulation of Bayes Formula in calculating shifting POA's will be introduced.

Probability of Success (POS)

In the past, the formula POS = POD X POA has been the overriding "end result" concept taught in M.S.F. courses. While POS can be a viable tool in certain phases of search management, its value as a basis upon which decisions may be made has been overstressed. In view of what follows, it is felt that POS is best limited to the planning stages in a search operation.

In past M.S.F. courses, the POS formula has been stressed as a quantitative measure of success for a given segment of the search area after it was searched. Assigning values for the probability of area (POA) and for the probability of detection (POD) and using the formula POS = POA X POD, a numerical representation of the success of the search effort could be determined. For example: Segment A has an assigned POA of .45 (45%) and is searched by a dog team with a POD of .80 (80%). Using the formula POS = POA X POD, the POS of Segment A was considered to be equal to .45 X .80 or .36 (36%).

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Many search managers were comfortable with a POS of .36 as a measure of the search effort. However, mathematically, a POS of .36 (36%) is meaningless and is invalid as a measure of a past effort. Realistically, there can be only two possible POS consequences after an area has been searched. Either the subject is found (POS = 1.0 or 100%) or is not found (POS = 0.0 or 0%). No other possibilities exist. The search is successful or it is not.

To illustrate this point, assume you plan to flip a coin. In your planning process, you calculate the POS for the coin landing heads up as .495 (49.5%) and the POS for the coin landing tails up as .495 (49.5%) and the POS for all other possibilities (such as landing on edge, rolling into the sewer, etc.) as .1 (1%). Now you flip the coin. (Equate the flip to searching the chosen segment). What is the probability of having the coin land tails up? (Equate this to finding the subject.) There are three possible outcomes: The coin lands heads up - giving us a POS of 0.0 (0%); or the coin lands tails up - giving us a POS of 1.0 (100%); or the coin is vaporized by a passing renegade Vietnamese battle cruiser that escaped from a video game. This also gives us a POS of 0.0 (0%) since we were looking for a tail.

Any attempt to measure success after the action is taken is pointless, because we already know the outcome. We have either succeeded or we have failed.

However, the POA X POD = POS concept remains a useful planning tool. It can be used to help predict how effective search efforts might be. Combined with the concept of "shifting POA distribution", decisions relating to redistribution of resources, increasing search area size or suspending a mission can be made using sound mathematical bases.

**Shifting POA Distribution**

In the past, the concept of shifting POA distribution has been greatly understressed. Using shifting POA distribution as a tactical search management tool will allow search managers to update probabilities and will accomplish what POS has been incorrectly used to do. First, the concept of a closed system versus an open system must be introduced.

**Refinement of Search Segmentation/POA Distribution - Closed System vs. Open System**

A common and useful practice in search management is segmenting the search area and assigning a value representing the probability of area (POA) to each segment. POA's are assigned based on group consensus, subject behavior statistics, or other means. The total of the POA's must equal 1.0 (100%). Traditionally, the technique has involved dividing the total POA only among the defined segments, that is "inside" a predetermined search area.
Example:

<table>
<thead>
<tr>
<th>Segment A</th>
<th>Segment B</th>
</tr>
</thead>
<tbody>
<tr>
<td>POA .25</td>
<td>POA .25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Segment C</th>
<th>Segment D</th>
</tr>
</thead>
<tbody>
<tr>
<td>POA .25</td>
<td>POA .25</td>
</tr>
</tbody>
</table>

The search area above has been divided into four segments, A through D. POA's totalling 1.0 (or 100%) have been distributed among the four segments. This example shows a "closed" system because all areas outside the defined search area are mathematically ignored. Distributing POA's in this manner completely omits the possibility that the subject may be outside the defined search area. Because an area might not be searched does not exclude the possibility that the subject might be there.

In this example, if Segment A is searched and the subject is not found, the POA of all segments is affected. The updated POA for Segments B, C and D will increase, while the POA for Segment A will decrease. Successive searches, in turn, of the other segments within the confines of this closed system finally will result in the POA's of all segments being the same as they were originally. Mathematically, we have come full circle. The following example demonstrates what happens to the POA's of segments in a closed system after repeated searches. Similar formulas are found in the "Summary of Search Theory" chapter in Search Is An Emergency.

Example Problem - Shifting Probabilities within a Closed System.

Continuing with the above example once again, the search area is divided into four parts and each is assigned a POA of 0.25. Each is searched, in turn, with a resource that will accomplish a probability of detection (POD) of 0.7. (This problem is also described on page 63, Search Is An Emergency Field Coordinator's Guide).

<table>
<thead>
<tr>
<th>Original POA's:</th>
<th>Segment A</th>
<th>Segment B</th>
<th>Segment C</th>
<th>Segment D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
</tr>
</tbody>
</table>

After Segment A has been searched with a POD 0.7, the probabilities of area change. The POA of Segment A decreases, and POA's of the other three segments increase. The updates can be determined by the following formulas:
(1) To determine the new POA of the segment just searched:

\[
\text{New POA}(A) = \frac{P_a \times P_m}{(P_a \times P_m) + P_n}
\]

Where: 
- \(P_a\) is the original POA of the segment,
- \(P_m\) is the probability the subject was missed, or \((1 - \text{POD})\), and
- \(P_n\) is the probability the subject was not there, or \((1 - \text{POA})\).

Therefore, to determine the new POA of Segment A after it has been searched with a POD of 0.7:

\[
\begin{align*}
\text{POA}(B) &= \frac{0.25 \times 0.3}{(0.25 \times 0.3) + 0.75} \\
&= \frac{0.075}{0.825} \\
&= 0.09
\end{align*}
\]

(2) To determine new POA's of any other segment:

\[
\text{POA}(X) = \frac{1 - \text{new POA}(A)}{1 - \text{old POA}(A)} \times \text{old POA}(X),
\]

Where: 
- \(\text{POA}(X)\) is the segment being determined
- \(\text{old POA}(X)\) refers to the POA prior to the segment being searched
- \(\text{new POA}(A)\) is the number obtained from the previous calculation.

To determine new POA of Segment B after Segment A has been searched:

\[
\begin{align*}
\text{POA}(B) &= \frac{1 - 0.09}{1 - 0.25} \times 0.25 \\
&= \frac{0.91}{0.75} \times 0.25 \\
&= 0.303
\end{align*}
\]

Similar calculations (and results) would follow for Segments C and D.

The updated POA's are:

<table>
<thead>
<tr>
<th>Original POA's:</th>
<th>Segment A</th>
<th>Segment B</th>
<th>Segment C</th>
<th>Segment D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>POA's after Segment A is searched (0.7 POD)</td>
<td>0.09</td>
<td>0.303</td>
<td>0.303</td>
<td>0.303</td>
</tr>
</tbody>
</table>
After Segment B is searched with a POD of 0.7:

\[
POA(B) = \frac{0.303 \times 0.3}{(0.303 \times 0.3) + .69} = 0.114;
\]

Then:

\[
POA(C) = \frac{1 - 0.114}{1 - 0.303} \times 0.303 = 0.385
\]

Etc.

The updated POA's now are:

<table>
<thead>
<tr>
<th>Original POA's</th>
<th>Segment A</th>
<th>Segment B</th>
<th>Segment C</th>
<th>Segment D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>POA's after Segment A searched</td>
<td>0.09</td>
<td>0.303</td>
<td>0.303</td>
<td>0.303</td>
</tr>
<tr>
<td>POA's after Segments A and B searched</td>
<td>0.114</td>
<td>0.114</td>
<td>0.385</td>
<td>0.385</td>
</tr>
</tbody>
</table>

Then Segment C is searched, followed by Segment D. The final POA's after all four segments have been searched, in turn and each with a POD of 0.7, are shown below. Note that they are identical to the original POA's! Little has been learned, except that the subject has not yet been found, and the search manager is back to the beginning.
### Table

<table>
<thead>
<tr>
<th>Original POA's</th>
<th>Segment A</th>
<th>Segment B</th>
<th>Segment C</th>
<th>Segment D</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25</td>
<td></td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>POA's after Segment A searched</td>
<td>0.09</td>
<td>0.303</td>
<td>0.303</td>
<td>0.303</td>
</tr>
<tr>
<td>POA's after Segments A and B searched</td>
<td>0.114</td>
<td>0.114</td>
<td>0.385</td>
<td>0.385</td>
</tr>
<tr>
<td>POA's after Segments A, B, and C searched</td>
<td>0.157</td>
<td>0.157</td>
<td>0.157</td>
<td>0.525</td>
</tr>
<tr>
<td>POA's after Segments A, B, C, and D searched</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
</tr>
</tbody>
</table>

**Note:** POI for each segment searched is 70% (±).

Note: If the above problem had been assigned unequal POA's and worked with varying POD's, the final POA's after each segment had been searched would not be identical to the original POA's. This is because the unequal POD's would have "reshuffled" the numbers. Nevertheless, while not as obvious, the effect is still the same. In a closed system there is no "escape valve"; that is, the possibility that the subject is outside the search area is not considered.

Shifting POA calculations in a closed system reveal little to the search manager. No valid quantitative measure of search effort has been gained to influence decisions about expanding the search area, to redistribute resources, or to justify suspension of the mission.

Given the limitations of using POS and shifting POA's in a closed system to base sound search management decisions, then how can the effectiveness of ongoing search efforts be measured? One answer is to use the shifting probabilities of area distribution concept with an "open system."

### Shifting Probabilities within an Open System

In the preceding example, if a POA value (no matter how small) is assigned to represent collectively all other areas not now being searched; e.g., the possibility that the subject is anywhere in the rest of the world, other than within the defined and segmented search area; then the system would be defined as "open."

Assume that defined segments are searched. No efforts are made to search anything outside the defined search area at this time. (Therefore, the probability of detection for the "all other" segment is zero.) As the search continues and the defined segments are searched again and again, the POA of
the "all other" segment exhibits a steady increase. As this occurs, the manager has a more realistic picture of the actual probabilities representing the location of the subject. A means with which to measure ongoing efforts now exists. A logical basis for answering questions such as: How should available resources be redistributed? Should the search be expanded? Should the mission be suspended, etc.? It is also a rational and logical means by which management decisions can be discussed, reviewed, or defended.

New Formula, Old Idea

The concept of shifting POA distribution should replace the POS concept as a tactical tool in search management. The mathematical concepts of shifting POA distribution are somewhat more complicated than POS calculations. However, a relatively simple formula for calculating shifting POA distribution is available and described here.

It can be shown that Bayes Formula from the Theory of Probability applies directly to the problem of computing shifting probabilities; in fact, these computations are immediate consequences of this formula. We do not go into detail regarding Bayes Formula but, instead, attempt to show here how it works. Toward this end, we need some notation.

We will let:

\[
\begin{align*}
A_1 & \text{ denote the event that the subject is in segment 1,} \\
A_2 & \text{ denote the event that the subject is in segment 2,} \\
\vdots & \\
A_i & \text{ denote the event that the subject is in segment } i, \text{ and so forth.}
\end{align*}
\]

Also, let:

\[
\begin{align*}
\tilde{D}_1 & \text{ denote the event that segment 1 is searched but the subject is not found,} \\
\tilde{D}_2 & \text{ denote the event that segment 2 is searched but the subject is not found,} \\
\vdots & \\
\tilde{D}_j & \text{ denote the event that segment } j \text{ is searched but the subject is not found, and so forth.}
\end{align*}
\]

As before, by "shifting probabilities" we mean an update of the POA distribution given that a certain segment has been searched but the subject was not found. For example, if segment 3 is searched but the subject is not found there, then it seems reasonable that the POA for segment 3 should now be lower while the POA for all other segments should be higher. Exactly how much these POA's should change is governed by Bayes Formula, which is adapted for our use below. First, we require some additional notation.
Let:

\[ a_1 = \text{POA for segment 1 prior to the update}, \]
\[ a_2 = \text{POA for segment 2 prior to the update}, \]
\[ \vdots \]
\[ a_i = \text{POA for segment } i \text{ prior to the update, and so forth.} \]

Also, let:

\[ d_1 = \text{POD for all completed search effort in segment 1}, \]
\[ d_2 = \text{POD for all completed search effort in segment 2}, \]
\[ \vdots \]
\[ d_j = \text{POD for all completed search effort in segment } j, \text{ and so forth}. \]

For brevity, suppose we have a given POA distribution at a certain point in time. This distribution could have come from a consensus, an analysis of past subject behavior data, or a previous update. Then this given POA distribution amounts to our knowing the following quantities (assume we have 10 total segments):

\[ a_1 = \text{POA}(A_1), \]
\[ a_2 = \text{POA}(A_2), \]
\[ \vdots \]
\[ a_{10} = \text{POA}(A_{10}). \]

Since this is a probability distribution, it must be true that

\[ a_1 + a_2 + a_3 + \ldots + a_{10} = 1 \]

(Note: According to a previous discussion, it is most realistic if one of these segments, say segment 10, accounts for the complement of the defined search area, that is, the "all other" segment.)

To continue: suppose, for example, segment 8 is searched with a POD of \( d_8 \) but the subject is not found. Then the "shifted probabilities", or the updated POA distribution, is computed using the equations (Bayes Formula) as depicted in Table I.
Table I: Example of the use of Bayes Formula.
Assumption: segment 8 is searched with POD of $d_8$ but the subject is not found.

<table>
<thead>
<tr>
<th>Notation</th>
<th>Meaning</th>
<th>Formula for POA Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P(A_1</td>
<td>D_8)$</td>
<td>Probability that subject is in segment 1, given that segment 8 was searched without results.</td>
</tr>
<tr>
<td>$P(A_2</td>
<td>D_8)$</td>
<td>Probability that subject is in segment 2, given that segment 8 was searched without results.</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>$P(A_i</td>
<td>D_8)$</td>
<td>Probability that subject is in segment $i$ (with $i \neq 8$) given that segment 8 was searched without results.</td>
</tr>
<tr>
<td>$P(A_8</td>
<td>D_8)$</td>
<td>Probability that subject is in segment 8, given that segment 8 was searched without results.</td>
</tr>
</tbody>
</table>

The shifted (or updated) probabilities computed in Table I supply the new POA distribution which takes into account the fact that segment 8 was searched. Hence, we

- replace $a_1$ by $\frac{a_1}{1 - d_8 a_8}$
- replace $a_2$ by $\frac{a_2}{1 - d_8 a_8}$
replace $a_7$ by $\frac{a_7}{1 - d_{8a8}}$,

replace $a_8$ by $\frac{(1 - d_8)a_8}{1 - d_{8a8}}$,

replace $a_9$ by $\frac{a_9}{1 - d_{8a8}}$,

replace $a_{10}$ by $\frac{a_{10}}{1 - d_{8a8}}$.

These new, updated probabilities will add up to 1, as they should.

If some new, additional information becomes available, such as segment 5 being searched without results, then we update the updated POA's by performing similar calculations to those in Table I. Notice that once $a_1$ is replaced by

$$\frac{a_1}{1 - d_{8a8}},$$

this replacement is used in the next bank of calculations.

Bayes' Formula, in general, implies that given a POA distribution for $n$ segments, namely

$$P(A_1) = a_1,$$

$$P(A_2) = a_2,$$

$$\vdots$$

$$P(A_n) = a_n;$$ then

if a certain segment, say $j$, is searched with a POD of $d_j$, the shifted POA's may be computed as follows:

$$P(A_i | D_j) = \frac{a_i}{1 - d_{jaj}} \quad \text{if} \ i \neq j,$$

and

$$P(A_j | D_j) = \frac{(1 - d_j)a_j}{1 - d_{jaj}} \quad (i \neq j).$$

The quantity $P(A_j | D_j)$ denotes the probability that the subject is in segment $i$, given that segment $j$ was searched without results. A comparison
of this formula with the example in Table I is useful and it is suggested that the interested reader make that comparison.

Example Problem: Segment the search area into 4 parts and assign each a POA of 0.24. Assign all other possible subject locations a POA of 0.04 (open system). We may think of this as segmenting the entire world into five segments with segment 5 consisting of all other possible locations.

Defined Search Area

\[
\begin{array}{c|c}
A_1 & A_2 \\
\hline
\text{POA}=0.24 & \text{POA}=0.24 \\
\hline
A_3 & A_4 \\
\text{POA}=0.24 & \text{POA}=0.24 \\
\hline
A_5 \quad \text{(all other)} & \\
\text{POA}=0.04 & \\
\end{array}
\]

Search segment \( A_4 \) with a resource that has a POD of 0.7.

To compute the updated POA distribution in this particular case, we first set \( d_4 = 0.70 \) and

\[
\begin{align*}
a_1 &= 0.24, \\
a_2 &= 0.24, \\
a_3 &= 0.24, \\
a_4 &= 0.24, \\
a_5 &= 0.04. \\
\end{align*}
\]

Then, using methods suggested by Table I above, we have:
\[
P(A_1 | D_4) = \frac{a_1}{1 - d_4a_4} = \frac{0.024}{1 - (0.7)(0.24)} \approx 0.288,
\]
\[
P(A_2 | D_4) = \frac{a_2}{1 - d_4a_4} = \frac{0.24}{1 - (0.7)(0.24)} \approx 0.288,
\]
\[
P(A_3 | D_4) = \frac{a_3}{1 - d_4a_4} = \frac{0.24}{1 - (0.7)(0.24)} \approx 0.288,
\]
\[
P(A_4 | D_4) = \frac{(1-d_4)a_4}{1 - d_4a_4} = \frac{(1-0.7)(0.24)}{1 - (0.7)(0.24)}
\]
(Note: same subscript)
\[
= \frac{(0.3)(0.24)}{1 - (0.7)(0.24)} \approx 0.086
\]
\[
P(A_4 | D_4) = \frac{a_5}{1 - d_4a_4} = \frac{0.04}{1 - (0.7)(0.24)} \approx 0.48
\]
TOTAL \approx 1.000.

We note that the information that segment 4 has been searched has resulted in an increase in the POA's for segments 1, 2, and 3, and a decrease in the POA for segment 4. The probability that the subject may not be in any of the defined segments being searched has increased from 0.04 to 0.048.
STRATEGY and TACTICS
- There's lots of new things happenin'...
CLUE ORIENTATION

OBJECTIVES: A student will be able to--

* Describe the function of clue detection as it relates to search theory.
* Identify the four categories of clues.
* Discuss the use of signcutting as a major factor in reducing a probable search area.
* Identify the major information categories that are crucial to effective search planning.
* Understand that training is the key to making it work.

References: "Guidelines For Information Gathering", by Jeff Doran. Some of the thoughts and ideas, by Bill Syrotuck. "How To Use Information Theory To Find Lost Persons", by Dennis Kelley.

Clue Seeking

Not only the searching for a subject, but the larger problem of defining characteristics and behavior (clues).

POA = Prior Knowledge + Subjective Analysis + "Intelligence."

1.0 According to the dictionary, a clue is a fact, an object, information, or some type of evidence that helps to solve a mystery or problem. Referring again to Webster, we find that to "seek" is to try and find, to trace or search for, to track down. Put the two together (clue seeking) and you have the essence of solving the classic mystery: ----finding the lost person. The purpose of clue seeking (gathering all the facts and information possible) is to assist us in our reasoning of the problem and its ultimate solution: ----(finding the lost person). It is important that we devise a method by which we can uncover clues that are relevant to a particular situation. Significant clues may provide the basis for major in-field tactics and actions.

"Clues evaluated through hindsight can be thrown in the wait till next time department, but this isn't enough. Search is a special task with life or death consequences. We must be able to account for our actions."

- Jeff Doran
2.0 **GENERAL PRINCIPLES OF CLUE SEEKING.**

a. Clue seeking is an on-going process that starts with preplanning, continues through a mission and doesn’t end until the critique and after action report is filed.

b. Good clue seeking is a learned skill, and must be practiced to develop a sense of what minimum information is needed to work with.

c. Avoid forming an opinion and then gathering information to support that opinion.

d. Don’t immediately form an opinion about the value of a clue.

e. Gather information from everyone, as no one person can adequately provide all the facts.

f. Assemble a complete profile of the missing subject and the situation and let it offer direction.

3.0 **THE MODERN APPROACH TO SEARCH IS CLUE ORIENTED.** In the past, search efforts were directed entirely toward the lost subject and as a result, overlooked a multitude of clues that were available to point the way. Today, search theory is dependent on clue detection, and is comprised of six basic elements:

a. The subject or clue generator.

b. The clues or messages.

c. The search area.

d. The searcher or clue seeker.

e. Time as it relates to a sequence of events.

f. Signcutting is a good method to detect clues.

3.1 **The Subject or Clue Generator:**

Fortunately for searchers, only the most cautious lost subject can prevent himself/herself from becoming a prolific signal generator. In fact, a common problem is multiple signal generators caused by the presence of witnesses, the public and even other searchers. The problem becomes which signals belong to whom? For the searcher, becoming familiar with the personal characteristics of the subject or signal generator is important. This is the place for the skillful interviewer. Strategic characteristics concern primarily the time period that subjects have been lost or missing (in order to estimate search area size) and his/her intent or destination. Tactical characteristics concern primarily descriptions of the subject, and his/her clothes and gear (for making identification of footprints and discarded articles).

---

There are always more clues than lost subjects. The ultimate clue being the lost person....
3.2 The Clues or Messages that are there to be found:

In general, there are four, simple (but very important) lost subject messages that searchers need to detect:

a. The present location of the subject is _______. (Subject found)
b. The previous location of the subject was _______. (Clue found)
c. The destination or intent of the subject was _______. (Clue found)
d. The subject was not here _______________. (No clues found)

However, some of these simple messages are hard to detect because of difficulties in identifying the specific search area.

There are four categories of search clues that searchers should be aware of:

a. Physical
   - Footprints.
   - Candy wrappers.

b. Recorded
   - Summit log.
   - Trail register.

c. People
   - Witness.
   - Persons contacted in search area.

d. Event
   - Flashing light.
   - Whistle.

The key to effective clue oriented search is to identify clues left by the lost subject and constantly monitor the search area for changes.

Clues, like wisps of smoke, are here one moment and gone the next. Footprints are blown away. Witnesses leave the search area. Summit logs are buried in the snow, flashing lights are never seen. The search area is volatile. Some clues not generated by the subject, and identified as such, will add to the confusion. A set of footprints in the search area may contain several messages, depending on whose footprints they are. If they are the subject's, the messages could be:

a. The subject was present previously.
b. The subject's destination can possibly be derived from his direction of travel.
3.3 The Search Area - It must include all of the clues.

a. A search without the subject (ultimate clue) is nonsense.
b. Searchers are best qualified to recognize and act upon clues.
c. There are prominent non-search clues.

In every search, **positive steps are required to assure that the subject does not leave the search area and that the search area is extended to include all clues.** Considerable understanding and expertise is required to detect clues and then to work with the plans section to clearly identify a clue when it is found and to interpret its message. The search manager must agree to an integrated attack on the problem, in order to properly act upon this message to a logical end. There may be prominent non-search clues such as the subject's home, a friend's home, the local bar, etc. The search area must be extended to include these areas. Other non-contiguous areas of search would be the location of witnesses or other clues, such as the subject's vehicle abandoned or towed to an impound area. Crime is seldom a cause of persons becoming lost or missing. **Clues are generated by the lost subject before he/she gets lost,** and it is important to back-track them to a point where activities are no longer pertinent to the situation.
3.4 The Searchers or Clue Seeker: There are no searchers in base camp except the most important one—the search manager. This paradoxical statement is intended to identify two important attributes of our message receiver or searcher:

- Searchers must be in the search area, i.e., deployed in the field to monitor the most probable areas.
- An overall strategy is needed to assure that all pertinent and significant areas are identified so that clues and clue messages can be detected and acted upon.

Finally, there is considerable significance in that last statement, "and acted upon." Search teams need to revise their training programs to teach searchers, i.e., receivers, how to follow up on the detection of various common clues to their logical conclusion. Specifically, the basis for "acting upon" a detected clue should first be interpreting the message. To enhance message interpretation, searchers should:

a. Immediately notify base camp of a clue/messages received.
b. Through group action, try to evaluate the clue or message in the field (work together).
c. Act upon the interpreted message in consultation with the plans section and the search manager.

Message/clue detection demands intelligence, concentration, and determination on the part of the searcher. Because the searcher is human, he/she will lose concentration with fatigue and miss the obvious without realizing it. Redundancy is the principle method of improving the probability of detection (POD) by the searcher. However, a common problem of field units is pressing on to the point of utter exhaustion and long after losing all effectiveness as clue detectors.

Searchers are best qualified to recognize and act upon clues because they train to:

- Identify and monitor the search area.
- Detect and act upon clue/messages.
- Be observant and not accept messages at face value or with predisposed opinions.

DETECTION RESOURCES

<table>
<thead>
<tr>
<th>CLUE/SUBJECT FINDERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Search Dogs</td>
</tr>
<tr>
<td>Hasty Teams (clue aware)</td>
</tr>
<tr>
<td>D.F. Equipment (Discern)</td>
</tr>
<tr>
<td>Grid Teams (clue aware)</td>
</tr>
<tr>
<td>Investigation Team</td>
</tr>
<tr>
<td>Tracking Team</td>
</tr>
<tr>
<td>Aircraft (under certain conditions)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUBJECT FINDERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid Searchers</td>
</tr>
<tr>
<td>Helicopters &amp; Fixed Wing Aircraft</td>
</tr>
<tr>
<td>Inexperienced Searchers</td>
</tr>
<tr>
<td>Dive Teams</td>
</tr>
</tbody>
</table>
3.5 **Time as it relates to a sequence of events** - all clues and messages should be time-tagged by searchers to help reconstruct the scenario that led to the lost person incident. This procedure is time consuming but extremely important as it keeps everything in perspective. **The key times in a search should be noted:**

a. When did the subject become lost or missing?

b. Projected **time frame for survival**.

c. **Time frame for the existence of clues** (How long could they be expected to last with a given type of weather?)

d. **When were the searcher resources deployed** in the field?

e. **How old are the clues** or when were they made?

f. **Time frame of when clues were found**.

---

**It is a good idea to make a log of all activities.** Some Explorer Search and Rescue groups have created an information unit that does nothing but define the search areas and record all clues found or occurring in them.
3.6 **Signcutting** (use of the Binary Search Theory) is sometimes an effective, efficient way to detect clues.

Signcutting is a procedure used by trackers to save time and to function more efficiently. While someone stays with the track, methodically following a step-by-step trail of clues, several other track and clue aware team members make a sweep out ahead to cut the same track sign. If they find tracks and are sure they belong to the subject, a leap frog system can be used to gain tremendous distance on the lost subject. **This same principle is used in the Binary Search Technique.** While team members stay at the last known point, others make sweeps through the probable search area trying to detect tracks or other evidence of the lost subject. If they are successful, much time and effort can be saved. The Binary Search Technique is most efficient in terms of limited resources and critical time factors because:

a. **The easiest way to find someone is to know where they aren't.**
b. **Selective sampling** of clues is better than looking at everyone.
c. **The search area circumference is more easily searched** than the area itself.

"What you see depends mainly on what you look for"

Many search and rescue teams use signcutting extensively. Vast portions of the search area can thus be eliminated from consideration, (at least primary consideration). For example, by signcutting, a search area with the Binary Method instead of by grid search, a sixteen element search area can be Binary searched with a maximum of four signcuts versus an average of eight grids. For a 1000 element search, the numbers are 10 versus 500. **The more the elements, the better Binary Search works.** Special training in signcutting is well worth the effort. However, like all things, signcutting cannot always be used. In addition, since humans perform it, it can't be perfect; redundancy is essential.

**Selective sampling is better than sampling every clue.** This can be illustrated with the famous bread crumb example. The subject was last seen eating sourdough French raisin bread topped with sunflower seeds. At a strategic fork in the trail we check for crumbs. To our surprise we find both sunflower seeds and pretzel crumbs. Signcutting each fork separately we find the sourdough went one way, and the pretzels went the other. Note that a trail of footprints or tracks can be treated as a continuous signal in many cases so that selective sampling is appropriate.

**SEARCHERS ARE BEST QUALIFIED TO RECOGNIZE AND ACT UPON CLUES**
The resource effectiveness of signcutting is often vastly greater than gridding. While numerous manhours must be used to grid search an area, few manhours need to be used to signcut it with comparable probability of detection (POD) if the terrain will allow this tactic. However, don't forget that sometimes gridding is a must; your acre of search area and the subject might have been covered with a foot of snow.

**SEARCH FOR THE CLUES AND NOT THE SUBJECT**, because

a. There are more clues than subjects.

b. Clue detection reduces the search uncertainty.

c. The information level of some clues approaches that of the ultimate clue. In other words, be clue conscious!

---

**BY ELIMINATION, VAST PORTIONS OF SEARCH AREA CAN BE NEARLY IGNORED.**

![Diagram](attachment:search_area_elimination.png)

---

**4.0 GUIDELINES FOR GATHERING CLUE INFORMATION.**

Did you ever go out the door or leave on a trip and know there was something you forgot? What was your first clue? In general, to discover what it was, you must mentally go backward through your activities or down a list in a step-by-step fashion. It is much easier and more efficient to organize in the initial stages of a search, or even before it begins. To prevent oversights and disorganization each clue seeker should write down what information he or she has received. In addition, the source and an estimate of its accuracy should be noted.
As the first sketchy information comes in, the process of gathering, recording and planning must begin. Eventually, information must be gathered under several topics, and should be arranged in chronological order. Since we begin with limited information when the subject is first reported missing, we can begin our search for clues from limited topics. The calls reporting someone missing generally are brief. The first data is usually sex and activity, such as, a male hunter, or a Grandmother who was berry picking. Clues from a statistical basis can offer the responsible agency a start. An agency’s first response can be conditioned by several areas of study.

The following is a list of information categories which can provide many hidden clues. In each category there are a series of questions or points which may prove helpful in the search manager’s quest for all pertinent facts:

4.1 Category of Subject

- 6-12 year old child?
- Hiker?
- Hunter?
- Berry Picker?
- Fisherman?
- Climber?

a. **Detectability:** The male hunter - good likelihood of bright colored clothes, probably dressed moderately-well for weather. Elderly female berry picker - statistically harder to detect, and because berry picking is a fair weather activity, she is probably less prepared for a change in the weather.

b. **Used Travel Aids:** Possibility of being found on a trail is known through data collection. This may indicate how productive road running or trail searching will be.

c. **Distances Traveled:** We all wish to feel comfortable with the decisions concerning "Are we searching far enough away? Have we decided on an optimal search area?" Again, the basis is through data collection.

d. **Survivability:** Here the elderly berry picker will be more susceptible than male hunter in any type of weather.

These initial clues can help the agency determine priority of the mission and what type of first response is preferrable from one mission to another.

4.2 **Point Last Seen or Last Known Position**

- Exactly where was it?
- Recreate the scene.
- Don’t change the Point Last Seen, but update the Last Known Position as clues give evidence of the subject’s movement.
- Pinpoint location on map.
- Physically go to the spot and study it.
This is also initial information, "13 year-old hiker, missing on return trip from High Rock Lake. Last seen approximately 3 miles from trailhead." The point last seen must be nailed down accurately "in the field." Because it:

a. Provides the base point for average distances traveled, and is the
b. Starting point of area survey for clues such as tracks, confusion
   factors on trail, short-cuts, etc.

4.3 Circumstance of Loss

- Known location?
- En route?
- Wilderness or inaccessible location?
- Re-create to the best of your ability.

This should be investigated with detail in mind. Here is where the witnesses and others in the area can add surety to when and where
the subject was (or was not, as this is just as valuable). In the
preliminary stages, the reported lost subject can be placed in one of
these categories:

a. Missing from a known location, that is, a known or some familiar
   location such as a picnic area, home, car, etc. This information
   frequently involves children and elderly people. Many times, the
   subject could have wandered off, unnoticed, in any direction,
   making it difficult to limit the search area. Under this
   classification, it may well be best to keep the scene secured to allow
   visual trackers or tracking dogs to work on direction of travel.

b. En route, a grouping where the subject is traveling a trail, ridge,
   logging road, etc., to a known objective. If en route to the objective
   the subject may be confused due to poor maps, poorly marked or
   maintained trails, intersections, etc. When returning from the
   objective, the subject may, partly due to fatigue, choose short-cuts
   or pursue straight line routes or wander off obliterated trails.
   Information of this nature should lead us to send people into the
   field that are trained to look for these types of clues.

c. Wilderness activities take people off the main trails or paths. This
   classification is generally composed of hunters and pickers who
   frequently are preoccupied with their activities and do not pay
   attention to changing terrain, weather or location of
   remainder of their party. Once again, we need searchers trained to
   seek these clues by "walking in the subject's shoes" to fill in the
   grey areas concerning circumstances of loss.

To be complete, we must get the timing of the events up to and after
the loss, including the weather then, not now!

d. The key points:

(1) How involved was subject in preparing for trip? May bring an
   insight into personality or underlying factors. (Such as being
   anxious to go, go go!)
(2) **Have the witnesses replay the events where they happened.**
This will assure you as to when or where the subject was last seen. Also work with other people who were witnesses or just in the area to "balance" the likelihood the information is accurate. **Example,** if possible, talk with everyone who you know was on the trail or in the campground, etc. at the time.

(3) **Know as well as you can, exactly when and where the witnesses and initial responders went to look for the subject.**
This can help dramatically when we assess what the subject did at the time of loss and shortly thereafter. **Example.** The entire family shouted for Grandpa in the vicinity where he was picking mushrooms. Judging from his doctors report, the man was in good condition. So although he could have had a problem in the immediate area and was not able to respond, it was more likely he was farther away. When Grandpa was found, 1.5 miles away "resting under a nice shade tree" it proved the search effort had made a suitable reaction to a very subtle clue.

(4) **Be sure and ask about the weather as it occurred that day.**
Knowledge of the condition can be crucial in determining its effect. Impaired vision from fog or low clouds (night-time), impaired judgement - hypo/hyperthermia, exertion from deep snow or slippery side hill.

### 4.4 Physical Condition and Health

- General capabilities (from two or more sources).
- Based on relative or friend's assessment or third subject party.
- State of health and condition at time of loss.
- Diabetic?
- Alcoholic?
- Drug user?
- Medications - effects and how often taken?
- Heart problems?

This information can be gathered in two parts. One is how the subject was feeling on this particular trip. It is important to get a detailed description and not just a brief answer like "she was feeling pretty good." Test it by asking just what she had been eating, or look for other clues that may indicate whether the subject was working above or below their norm. Secondly, get a feel for the usual day to day conditioning of the subject. A good example was a search for an elderly lady, who due to the terrain was not expected to have traveled out of the immediate area. However, opinions changed when the family mentioned she had just purchased a new bicycle for herself! Get answers "from two (at least) sources to compare accuracy. Preferably, one person outside the family such as a friend or fellow worker. This may require having the person brought out from town.
a. Many witnesses will not recognize signs of fatigue, hypothermia or inadequate calories.

b. Family may not offer information about physical or mental problems.
   - Reluctant to mention senility.
   - Reluctant to mention mental illness (depression or even retardation).

Family members should be interviewed separately and watch for uneasiness as they try to avoid referring to a "problem." Reassure them that their answers will help in finding their loved one. The family doctor may offer insight into the subject's health. In any case, remember the family is desperate to perceive just what has happened to a loved one and may under or over emphasize a mental or health problem.

c. Over emphasis: heart attack, stroke, arthritis.
d. Under emphasis: senility or mental health.

4.5 **Personality**

- Aggressive?
- Ponderer?
- Loner?
- Self-sufficient?
- Upset easily or irritable?
- Despondent?

Once again we should gather information from several sources, such as hunting partner, co-worker, initial witness or family members. Not all will be present at search site. Don't fall into the trap of seeking these individuals after plans do not go right.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
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<tbody>
<tr>
<td>Independent</td>
<td>Aggressive</td>
<td>Dependent</td>
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<tr>
<td>Perservering</td>
<td>Anxious</td>
<td>Reserved</td>
</tr>
<tr>
<td>Realistic</td>
<td>Neglectful</td>
<td>Composed</td>
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From these three simple groupings, which is most likely to over exert or take a chance? Who has best chance at surviving in poor conditions? Which would seek shelter? Which is most likely to be a moving target? Pick one to become high risk -- priority one search.
4.6 Equipment

- Size?
- Color?
- Brand names?
- Extra gear?
- Shoe size and description?
- Candy, cigarettes, etc. with labels and variety?

When getting descriptions of the subject’s equipment and clothing we can assess their capability or expertise at their activity. It is easy to predict who is at high risk between two hunters, one wearing rubber boots and blue jeans while the other is in pack boots with felt liners and wool pants. A list of equipment, clothes and colors for the searchers gives them something to tune their eyes for, but, it must be accurate, for when an article is found, it frequently becomes the most important clue with a major shift in search planning. That is a high cost if the equipment list is compiled on a casual, aimless basis.

Track identification. Again, the cost of ignoring a possible track, or identifying the wrong track is enormous.

1. If available use a picture catalog of prints.
2. Go to town and pick out an identical pair. The time used in this is insignificant compared to the time spent on the wrong track.
3. Accept no ball park figures on the size of a track found in the field. Carry a small tape measure or if necessary, break a small stick to the size of the track you found.
4. Preserve the initial track.
4.7 Terrain Analysis

It is best to look for terrain clues in two parts. The first is how the terrain would affect the subject in becoming lost. Don’t just accept that the person is missing from the last known point, and start looking some distance away for distinguishing features. Get yourself in the subject’s shoes, analyze where he/she was, what he/she was doing.

a. **Mazes-areas**, riddled with so many intersections he/she would be likely to take wrong one. This area needs to be accurately mapped.
b. **Confusion factors** such as multiple routes, forks in trails, dead ends, changes in terrain that the subject may not recognize although he/she is only a short distance from where he/she thought he/she should be. Look for sights or sounds that could attract him/her. Possible short-cuts or switch backs. Parts of trails may be hard to find because of lack of use.
c. **Cut off escape routes** (confinedment).
d. Look for **routes of least resistance**.
e. **Plan for all possibilities**, not just your favorite.
f. **In which direction could they disappear in the shortest time?**

Certainly, on some searches it will be difficult to determine what are the likely routes of travel. We can still assess terrain assuming the subject went in a particular direction. This also applies to when there are likely routes from the last known position. If you have suspected a particular direction of travel, look for terrain lures that will affect continuation along a route. **Search area can be limited by these factors:**

a. **Major barriers such as rivers, highways, cliffs, some trails, slippery banks, lava fields, railroads**. These are features that would likely stop the subject’s direction of travel (may lead to a new direction, i.e., walking along a powerline).
b. **Minor barriers include small streams, dense brush, downfall**. They are passable if subject has reason to cross them.
c. **Natural routes offer less resistance to movement or may eventually confine a victim** (large steep drainage). Some are old road grades, game trails, and drainages, or clearings. NOTE: Establish definitions in your unit for words that may be similar, i.e., borders, boundaries, and barriers.
d. **Look for only area where subject is not cut off by main roads or barriers, etc.**

A good exercise for a unit is to have classroom work with maps of varying terrain (or overheads) for the sake of identifying, labeling, and discussing what effect terrain features may have.
5.0 **LAST TO CONSIDER IS THE CRITIQUE OF THE MISSION.** It can provide rich information as well as clues that were overlooked.

- How did we do?
- What did we overlook initially?
- What was done right, what was done wrong?

This information, if catalogued and noted, can be used on nearly every mission. If not for strategy or tactics, then for planning or visa versa. Include everyone if possible, even the subject.

**NOTE:** Refer to chapter on "Post Mission."

6.0 **SUMMARY**

6.1 Search theory is dependent upon clue detection.

a. Search for clues instead of subjects.

6.2 Four categories of clues: physical, recorded, people, event.

6.3 Clue detection resources: clue finders; clue/subject finders; subject finders.

6.4 Assemble a complete profile.

a. Clue seeking is an on-going process.

6.5 Signcutting is an effective search tactic.

a. The easiest way to find someone is to know where they aren't.

6.6 AT SEARCH BASE ALWAYS HAVE A TEAM READY TO RESPOND/FOLLOW-UP ON A "HOT" CLUE!

**SIGN CUTTING (Binary Search)**

*is an effective search tactic.*

"THE EASIEST WAY TO FIND SOMEONE IS TO KNOW WHERE THEY AREN'T."

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GENERAL PRINCIPLES

1. Assemble a complete profile
   - Let it offer direction, but
   - Don't form early opinions and then collect info to justify/support your opinions

2. Clue seeking is an on-going process
   - Doesn't stop until victim is found.

3. KNOW - minimum planning/search data that is required.

4. NEVER - minimize the value of a clue.

5. No one person can adequately gather the facts.
APPLYING SAR RESOURCES IN SEARCH OPERATIONS

OBJECTIVES: A student will be able to--

* Discuss why proper application of SAR Resources composes the foundation of effective SAR Management.
* Use a combination of strategies in applying resources for a given situation.
* Relate possible conflicts between resources which have been applied in the same or adjacent search areas.
* Describe the possible sequence of initial attack resources in a given area.
* Relate the importance of knowledge of resources and their capabilities in properly applying those forces to field operations.

APPLYING SAR RESOURCES:

Initial Tactics --

- Match the right resources with your needs and the situation.
- Diversify your resource options.
- Back-up and support your resources.

1.0 SEARCH IS AN EMERGENCY - This is the ultimate reason for fast, efficient application of SAR resources.

1.1 During the initial response phase of any search mission there are a great number of unknowns compared to the facts that are known. Because an individual's life may depend on time, it is extremely important to consider these unknowns constantly:

a. The missing subject may need immediate emergency care.
b. The subject may need protection from the environment and even himself/herself.
c. Time and weather can destroy valuable clues.
d. Urgent response to a lost person incident reduces the uncertainty of large probable search areas.
APPLYING RESOURCES

ASK YOURSELF:

• IT IS BETTER TO USE THE RESOURCES I HAVE AVAILABLE NOW TO KEEP THE AREA FROM GETTING BIGGER?

• OR, USE THEM TO TRY TO FIND THE SUBJECT?

CLUE FINDERS  ∨  CLUE SUBJECT FINDERS  ∨  SUBJECT FINDERS

INITIAL ATTACK

Immediate offensive efforts to find victim

Most effective resources:

• HUMAN TRACKERS
• DOGS (AIR SCENTING)
• DOGS (TRACKING, DEPENDING ON WEATHER, ETC)
• TRAINED (CLUE CONSCIOUS) HASTY TEAMS
• AIRCRAFT COUPLED WITH:
  • Confinement
  • Attraction (where feasible)
  • Binary search
  • Hasty search
1.2 Since every jurisdiction is not blessed with an excess of SAR resources, and urgent response is crucial for efficiency's sake as well as the missing subject's proper application of resources is the search manager's only viable alternative.

TO PROPERLY RESPONSE TO THE LOST SUBJECT'S EMERGENCY, THE SEARCH MANAGER MUST:

- Respond urgently.
- Search at night.
- Aid searchers any way possible.
- Create an atmosphere of positive urgency.
- Include non-contiguous areas of search in proper perspective.

2.0 ORGANIZING YOUR RESOURCES; AN ESSENTIAL FIRST STEP

2.1 Any human or physical assets that are committed to on-scene support of search operations should be considered resources and used appropriately. Full well realizing that committing resources to the field is essential to finding a lost subject, it is equally important to assign the proper personnel and equipment simultaneously to the function of providing management. **If the entire effort is to run smoothly, this control function must be firmly established early on.**

There is nothing more frustrating for a search and rescue volunteer than to arrive at base camp ready to immediately depart for the field, and have to stand around for several hours while someone sorts out tasks and specific field assignments; In other words, get organized!

2.2 As we have already discussed in the Chapter on Organization, **operations is responsible for what goes on out in the field.** Part of the initial planning process is the development of a Search Action Plan, and the key figures in the planning process are the Operations Chief and the Search Manager. Assign the Operations Chief early and pick an individual that is well trained and experienced in the function.

2.3 In order to properly manage the specialized resources that are either on-scene or due to arrive, the Operations Chief should immediately assume or assign the responsibilities of Staging Area Manager. This function is responsible to insure that all arriving resources are accounted for, ready for field assignment and able to respond within minutes of management request.
2.4 If aircraft have been requested to assist in the search effort then
consideration should be given to establishing an air operations
branch. If only one aircraft is requested or used, the Operations
Chief may simply assume that position him/herself. If several
aircraft are needed, then a specialized branch must be established
to manage the following functions:

a. Establishing helibases and helispots.
b. Operating helibases and helispots.
c. Maintaining records on both fixed-wing and helicopter aircraft.
d. Maintaining required liaison with fixed-wing aircraft that are
   using off-scene facilities.
e. Maintaining all timekeeping for aircraft assigned to the search.
f. Establishing all logistical and supply needs for air operations.

2.5 Although all of these functions may have to be performed by a single
person during some missions, it is incumbent upon every search
manager to be prepared to delegate all of these jobs and many more
if the situation escalates and the need arises. (See the Chapter on
Organization.)

3.0 RESOURCE PRIORITY AND CATEGORIES

3.1 We have discussed the concept of establishing where to look and
especially defining a piece of real estate around which the search
manager could draw a line on a map. At some point the Search
Manager or the Operations Chief has to make the decision about
which resources will be committed to the field, and in which order.
Countless case histories have proven that this is a critical step in
the management of search operations.

3.2 An essential part of this decision process is a full understanding of
resource capabilities and limitations. There is no substitute for this
knowledge and it cannot be overlooked if the mission is to be
successfully managed. (Reference the Chapter on SAR Resources.)

3.3 In review of suggested guidelines from the ICS System described in
the Organization Chapter, resources can generally be classified into
three basic categories:

- **Single Resources.**
- **Strike Teams:** A number of similar resources working
together under a common supervisor or leader.
- **Task Forces:** Any combination of resources put together
for a specific assignment.

3.4 Although the nomenclature for these categories of resources may
seem foreign to the search management arena, they are terms that
provide continuity with other forms of emergency response now
being used in many areas of the country.
4.0 **RESOURCE IDENTIFICATION -- CAPABILITIES -- SOPS. (KNOW YOUR RESOURCES)**

4.1 Each resource which is available to a jurisdiction should have key information readily available to the Search Manager. It should be an addendum to the Preplan or available in a resource file which is quickly accessible, especially if the Search Manager function may fall on any one of several personnel. The following is an example of key information for one particular resource.

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**HASTY TEAM**

**DEFINITION:**

An initial response team of well trained, self-sufficient and highly mobile searchers whose primary responsibility is to check out those areas most likely to produce a subject first. (i.e., trails, trail heads, roads, roadheads, campsites, lakes, clearings, etc.). Their efficiency and usefulness is based upon speed of response and accuracy of first-hand information assimilated at the scene.

**OPTIMUM SKILLS:**

Track and sign awareness, (best to have tracking skills). Clue and subject oriented. Ability to interview accurately. Familiarity with the local terrain and inherent dangers of the immediate area. Complete self-sufficiency in the outdoors. Advanced first-aid skills or better. Pinpoint navigation skills.

**EQUIPMENT:**

**Minimum:** 48 to 72 hour pack.
- Radio communications.
- First-aid supplies.
- Compass.
- Map of area.
- Essential basic climbing gear (if near mountainous terrain).

**Optimum:** 72 hour pack.
- Ground to air communications.
- Paramedic supplies.
- Lensatic or Silva type compasses.
- Grided 7.5 minute topo maps of the area.
4.2 The following was adapted from the Chelan County, State of Washington, Sheriff's Professional Hasty Team S.O.P.

**HASTY TEAM RESOURCE SOP**

**INITIAL RESPONSE:**

I. Call out (team activation) will be after proper qualification of mission needs.

A. Accordingly, a uniform patrol captain shall qualify the reporting party. In his absence, the deputy nearest the location of reporting party will be dispatched to obtain specific information as follows:

1. Subject's name, address, age, home telephone number.
2. Name of reporting party, address, home telephone number.
3. What is wrong with the subject?
4. Where was the subject last seen?
5. Subject's clothing, experience level in outdoors, special medical conditions, and is anything being done for the subject?
6. Type of terrain, weather conditions— if known.
7. Any other pertinent information that may assist in aid to the subject.
8. Maintain constructive control of the reporting party until released by the ON-SCENE-SEARCH MANAGER.

B. Procedure if Hasty Team response is indicated:

1. The ON-SCENE-SEARCH MANAGER shall be assigned by the uniform patrol captain and in his absence the designated Search and Rescue deputy in that area. That ON-SCENE-SEARCH MANAGER will make contact with the reporting party for interview. Team members will be activated and respond according to the direction of the ON-SCENE-SEARCH MANAGER. Response time should be in minutes because of preplanning and preparedness.

2. The radio dispatcher will begin filling out the Search and Rescue report; shall notify the stand-by team at the direction of the OPERATIONS CHIEF. The radio dispatcher will also obtain a mission number at that time.
OPERATIONS:

1. The ON-SCENE-SEARCH MANAGER shall be in charge of the search and/or rescue until relieved by a designated successor.

2. The ON-SCENE-SEARCH MANAGER will brief the team at a predetermined location.

3. The OPERATIONS CHIEF shall be in charge of logistics and advisory to the ON-SCENE-SEARCH MANAGER.

4. Search and Rescue methods will follow preplanned mission briefing.

5. In case of an unsuccessful Hasty Team search, a forward SPIKE camp will be established by the ON-SCENE-SEARCH MANAGER.

6. PROCEDURES ON ESTABLISHING FORWARD SPIKE CAMP

   A. Critique of initial search efforts and subsequent recommendations will be given to the Patrol Captain in the on-going search/rescue mission.

   B. Establish communications.

   C. Arrange contact with a designated OPERATIONS CHIEF at the earliest time. This will require one Hasty Team member coming out with recommendations, assessing the situation with the OPERATIONS CHIEF and returning to forward spike camp. The exception to this will depend on type of mission and communication with the Patrol Captain.

   D. If a helispot has not been established or chosen, it shall be established at the earliest possible time.

   E. The OPERATIONS CHIEF will communicate progress of logistical support to spike camp as soon as possible so as to enable the Hasty Team to make adjustments in mission planning.

   F. The ON-SCENE-SEARCH MANAGER in Spike Camp will be in charge of resources coming to forward base camp and mission area.

   G. A search base will be established and managed by the OPERATIONS CHIEF, dependent upon logistics, type of mission, adequate reponse time, etc.

   H. After establishing a search base, the OPERATIONS CHIEF and the ON-SCENE-SEARCH MANAGER will communicate at regular intervals to maintain knowledge of mission progress, i.e., logistical and man power instructions, direction of travel, area searched and progress of special rescue skills.
7. News releases will follow Sheriff's Office Policy—-with information coming from OPERATIONS CHIEF only.

8. After 24 hours, the Hasty Team mission is complete. They will either walk out or be heli-transported to search base. At this time, search base will become the base of operations. The ON-SCENE-SEARCH MANAGER will remain in charge or be relieved as the situation dictates. The mission will be totally controlled from search base.

9. A post mission critique shall be held as soon as practical with all teams.

10. Out of county requests for response will be cleared through the Sheriff and the Uniformed Patrol Captain. The Hasty Team will operate as a resource, and advisory team on request, with the Search/Rescue Manager provided by requesting agency.

5.0 GUIDELINES FOR ESTABLISHING STRATEGY AND TACTICS IN APPLYING SAR RESOURCES.

5.1 STRATEGY: *The general, overall search plan resulting from a combination of preplanning and action planning efforts.*

Example Operational Strategies:

   a. Establish and segment the search area.
   b. Initiate an investigation.
   c. Develop a subject profile.
   d. Search for clues.
   e. Confine subject to the search area.
   f. Conduct night searches.
   g. Identify and prioritize high probability areas.
   h. Identify and prioritize high hazard areas.
   i. Establish an operations management team.
   j. Determine point last seen or last known position.
   k. Prevent search area contamination.
   l. Establish a rescue and recovery plan.
   m. Prioritize available search resources.

5.2 TACTICS: *All the techniques, procedures and methods used to actually find the subject or clues.*

Example Operational Tactics:

   a. Use search dogs first in the high priority areas.
   b. Open grid search with 200 ft. spacing.
   c. Run all trails and ridges for tracks and sign plus 100 feet on either side.
   d. Establish track traps in 4 specific areas.
   e. Re-search two areas with different resources.
   f. Interview hunting partner for favorite area information.
   g. Interview all hikers in the area.
h. Detail 3 personnel to follow-up on all physical clues.

i. Sound patrol vehicle sirens once every hour from the same location.

j. The helicopter will concentrate on the two open drainages twice a day at low altitude.

k. Fixed wing aircraft in Grid 155 will fly 200 feet contour patterns in the extremely steep terrain.

5.3 Perspective on Searching Tactics.

a. The initiation of searching tactics normally takes place very soon after the FIRST NOTICE and concurrently with ESTABLISHING PROBABLE SEARCH AREA.

- Searching tactics normally involve a definite progression of techniques, methods and procedures. Experience and case studies continually point out the need for using the right resources in the right order.

5.4 Modes of Searching Tactics.

a. There are two basic modes involved in searching tactics, each of which will be explained in detail in the following sections. The modes which are usually used together are:

- Attraction and Confinement Mode (PASSIVE) - You make the subject come to you.

  1) PASSIVE Procedures.

   - Wait ----------------
   - Confinement -------
   - Attraction ---------

- Detection Mode (ACTIVE) - You find the subject.

  2) ACTIVE Procedures.

   Go out in the field and get the bugger!
   Commit resources to specifically look in certain places.

b. The use of active or passive mode largely depends on the following:

   - relative urgency assigned to the mission.
   - quantity, quality and availability of search resources.
   - existing hazards (weather, man-made or natural hazards).
6.0 **ATTRACTION: - PASSIVE MODE.**

6.1 In many jurisdictions, historical data has defined common areas of confusion or terrain that funnels a subject into a specific location. In general, within a certain period of time the subject can be expected to walk out or show up. In these cases passive tactics may be used. These procedures allow the subject to come to you (walk out) or provide attraction points to guide and encourage mobile subjects to move to a certain location. Additionally, these efforts can provide encouragement to immobile victims.

6.2 **Examples of Passive Modes:**

   a. **Visual Attraction.**

      - *lights*  
      - *beacons*  
      - *sky writing*
      - *flares*  
      - *strobos*  
      - *balloons*  
      - *fires*  
      - *smoke*  
      - *a streaker*

      - Attraction can often be used effectively with CONFINEMENT techniques. Confinement was discussed earlier in a separate chapter and is the major tactic used to limit your search area.

   b. **Sound Attraction.**

      - *horns*  
      - *sirens*  
      - *voice*  
      - *P.A. systems*  
      - *discharging a firearm*  
      - *farting and belching*

   c. When using noise, do not forget to LISTEN (for a response by subject) for some time after making noise. Also, do not overlook the fact that in valleys, canyons, and mountains, noises reflect and echo, which can cause added confusion for the subject.

   d. **Investigation (by phone).**

      - *friends*  
      - *family*  
      - *doctor*  
      - *school*  
      - *nurse*  
      - *clergy*  
      - *employer*  
      - *associates*  
      - *business*

   e. Wait, Let the Subject Walk Out to You.

   f. Media - Use Bulletins or Requests for Info.

   g. Aircraft Flyovers.

7.0 **DETECTION MODE:**

7.1 **ACTIVE Procedures** (Detection Mode) are those methods designed to seek out the subject or clues in the probable search area, while at the same time reducing the potential area as much as possible. They involve overt commitment of resources into the field to find the subject or clues and very specific actions by searchers.
PASSIVE - Subject comes to you by:
A. WAITING UNTIL HE COMES OUT
B. CONFINING SUBJECT
C. ATTRACTING SUBJECT

ACTIVE - You look for subject:
A. CLUE FINDING
B. HASTY SEARCH
C. GRID SEARCH

COMBO - Using all or part of either at some time

DEPENDS UPON PRIORITY & RESOURCES AVAILABLE

• INITIAL ATTACK

GENERAL PLAN (DIRECTION)
MINIMUM CONTROL

INDEPENDENT

Visual Trackers
Tracking Dogs

DEPENDENT INDEPENDENT

Tracking Dogs
Hasty Teams

YOU

FULL SCALE
DETAILED PLAN

FIRM CONTROL

Grid Searchers
4x4, Horses

• Effectiveness of resources is dependent upon planning and control.
• Decision to use resources is dependent upon your ability to plan and control and time.
7.2 There are **three distinct types of procedures**.

a. **Type I** - Rapid response to areas of high probability by immediately available resources.

**TYPE I - CRITERION IS SPEED**

**✓ Type I - considerations:**

1) The assumption is (depending on elapsed time between when subject went missing and when reported) that you are looking for a RESPONSIVE subject.
2) It provides an immediate show of effort.
3) It can help define the search area by gathering intelligence or locating clues, or in follow up after a clue is located.
4) Clue-consciousness is critical.
5) It often results in determining where **NOT** to search further.
6) Preplanning is crucial for the availability and effective use of Type 1 resources.

**✓ Type I - techniques:**

1) Investigation (personal, physical effort).
2) Thorough checks of last known position (for clues, tracks, direction of travel, etc.)
3) Follow known (or suspected) route.
4) Trail running.
5) Perimeter check (may be in conjunction with confinement).
6) Sign cutting.
7) Road patrols.
8) Check attractions.
9) Check hazardous areas.
10) Check drainages.
11) Ridge running.
12) Bastard search.
13) Locating any clues.
14) ELT/Direction Finder Search.

**✓ Type I - Most Effective Resources:**

1) Investigators.
2) Trained (clue-conscious) composite hasty teams.
3) Human trackers (for both tracking and sign cutting).
4) Dogs.
5) Aircraft.
6) Other, very mobile, **trained** resources.
b. **Type II** - A fast, systematic search of a high probability segment of the search area using techniques that produce high probabilities of detection per searcher-hour of effort.

**TYPE II - CRITERION IS EFFICIENCY**

**✓ Type II - Considerations:**

1) Often employed after Type I efforts in some segments, especially if Type I tactics found clues.
2) In other search segments, particularly heavily vegetated ones, may be the initial search tactic used.
3) Should be used when subject RESPONSIVENESS is assumed to be still high.

**Type II efforts are often effective in locating clues.**

**✓ Type II - Techniques:**

1) Used in a specifically defined segment of the search area.
2) Used to follow up in a segment where a clue has been found.
3) Uses an open grid, with wide spacing between searchers.
4) Search routes often are followed using compass bearings.

**✓ Type II - Most Effective Resources:**

1) Investigators.
2) Clue conscious teams.
3) Dogs.
4) Trackers, sign cutters.
5) Aircraft.
6) Trained grid teams.
7) Other trained teams.

c. **Type III** - A slower, highly systematic search, using thorough techniques.

**TYPE III - CRITERION IS THOROUGHNESS**

**✓ Type III - Considerations:**

1) Should be used only as last resort.
2) Usually, Type III searches are extremely destructive to clues, because persons used are not clue conscious.

**✓ Type III - Techniques:**

1) Closed grid or sweep search.

**✓ Type III - Most Effective Resources:**

1) Trained grid search teams.
8.0 SEARCH PATTERNS AND TECHNIQUES

8.1 Outline of Basic Search and Rescue Field Procedure.

| Type I:    | Ridge running, trail land drainage investigation, structure inspection. |
| Type II:   | Fast, open grid.                                                         |
| Type III:  | Area saturation, close grid.                                            |

8.2 Type I Search

a. This method is used when the search team arrives at the scene shortly after the subject is reported missing. Team leaders are quickly briefed by the Search Manager. Maps and radios are issued. Small teams, usually four persons, are dispatched to check adjacent trails, ridges, drainages, ponds and all known structures in the area such as abandoned cabins, barns, sheds, lookout, etc. Some of the roads can and should be continually patrolled by vehicles, but many unused logging and fire roads, impassable for vehicles, must be checked on foot or by horse-mounted patrols.

b. The ridge running technique is used when a very large area is to be searched, primarily for downed aircraft and when no probable area can be selected. The position on the ridges affords observation into drainages and on the ridges where crash sites are likely.

c. Each team checks its assigned area carefully for trail signs, footprints, evidence of a recent campfire and other clues. All structures are thoroughly checked for signs of recent habitation. Often a lost person will discover a road or trail unfamiliar to him and stay there or travel in the wrong direction. Many times, this quick check of fairly easy-to-search areas will pick up the lost person before his predicament becomes serious.

d. When checking trails, ridges, and drainages, the travel direction of the search teams, if conditions permit, should be from the perimeter of the area toward the center. Many times the lost person, traveling rather fast, will stay ahead of a search team if both are on the same out bound course.

8.3 Type II Search - Planning

a. If it is certain that all trails, ridges, drainages and structures have been checked and reported negative, or a Type I search has taken place, a Type II search pattern is then used. The objective is to cover the sectors or geographical areas rapidly and efficiently. A Type II search pattern assumes the lost person, if not injured and other than an elderly person or small child, is alive and moving and can respond to a shout if within earshot.
b. The general search area is broken down into search sectors which are geographical areas bounded by roads, trails, streams, powerlines or prominent ridges easily identified on a map. Search teams of 6 to 10 members are set-up, each with an experienced, qualified team leader and selected specialty personnel, and assigned to search the various sectors. If the terrain is mostly open country, a 10-member search team can be used to advantage. In dense, brushy areas the team should be reduced to 6 to 8 members to maintain efficient line control. Several 6 to 8 member teams, working the same sector can cover an area faster and more efficiently than one 16-member team which tends to become slow and difficult to control.

8.4 Type II Search - Personnel

a. The members of the team and the team equipment should be listed on a registration form along with pertinent information regarding the area to be covered, compass headings, radio information and data concerning the lost person. The team member’s number signifies his position in the search line.

b. If conditions warrant, and experienced manpower is available, a team member to back-up and patrol behind the search line is advisable. It is the duty of the back-up man to check the progress of the line, help keep it in order and investigate any clues or evidence that might be discovered by the line personnel. Always though, the team leader is the boss of the team in the field!

c. The make-up of a Type II search team will vary according to available personnel and type of terrain. It is essential to have at least the above mentioned positions manned on each team. Additional personnel can be added if the team is operating in fairly open country. Too many members, however, become too spread out and difficult to control.

d. A preliminary study of an area will indicate the condition of the terrain and team members can provide special equipment to fit this condition. Only those members who carry special equipment for mountaineering and are trained and qualified in its use should check out vertical or precipitous terrain. If ponds, rivers or lakes in the area indicate special attention, a scuba team can be called in to investigate underwater conditions.

e. The search team radio operator on a Type II search pattern is not assigned as a line member but travels close to the team leader at all times. His special duty is to act as a communications link between the leader on the search line and the radio dispatcher at base camp. The team radio operator is detached from a particular search line position and relieved of search line duties. He does not participate in the regular line counts and command calls. With the team radio operator thus relieved of search line duties and responsible only for
team-to-base communications, the line can move faster and both search activities and team communications become more efficient.

f. Although each team member is an individual searcher, his main job is to perform his duties so the complete team can efficiently perform its primary function, which on a Type II search, is to cover a large area as rapidly as possible. Remember always, the team is the eyes and ears of the search effort.

8.5 Type II Search - Procedure

a. In action, a Type II search team is lined up in numerical order with the team leader usually on the left end. The members are spaced from 50 to 300 feet apart, depending on the type of terrain. Since the two ends of the line are far apart, voice commands must be passed down the line from the leader. At the start and periodically during the advance of the team, a line count is made. The team leader halts the line and calls his line number, "1". Each team member in turn, shouts his number until the count reaches the other end. The last man repeats his number and the count is continued in reverse order back to the leader. This reverse count assures the team leader that all members of his team are in line. The loud shouting notifies the lost person of the team’s whereabouts. The halt during the line count provides an opportunity for the team members to re-group and re-form their line positions if necessary.

b. In order to maintain an orderly straight search line, each member advances only when he repeats the "All Ahead" command plus his line number as relayed from the team leader. The searcher starts his forward motion only when he relays the command, thus always a step or two behind the man on his left. He attempts to maintain this position while the team is advancing. The line proceeds in its assigned direction of travel on a slight diagonal. When the team has traveled about 1,000 feet, or as far as the sound of the previous shouted line count has carried, the team leader calls the command "Halt-1". Each member comes to a stop when he relays this command, plus his number. At this point, the line should be fairly perpendicular to the direction of travel. Another line count is made in a loud voice. It is extremely important to maintain a full 30-second period of absolute silence at the completion of each line count to listen for a possible reply from the lost person. On a Type II search pattern, ears are much more important than eyes in locating a lost person, as vision is usually limited by forest growth.
c. After each line count and the 30-second period of silence, the team leader calls "All Ahead-1". This command, plus the sequential line numbers is relayed down the line and the procedure is repeated. If for any reason an individual team member wishes to halt the line he can do so by having his line number and the command "Halt" relayed to both ends of the line. The team retains its line position while the leader, his assistant or back-up man investigate the reason for the stop.

d. Immediate line counts can be made while the team is advancing to allow the members to better maintain their line positions. However, all unnecessary conversation and personal comments must be avoided to better hear the leader's relayed commands and possible calls from the lost person.

8.6 A USEFUL TYPE II TECHNIQUE

a. Use a three (3) person team, with one compass-bearer. This team works independently from other teams.

\[ X \quad 0 \quad 0 \quad X \quad 0 \quad 0 \quad X \quad 0 \]

\[ X = \text{compass-bearer - basically a non-searcher. Follows designated bearing.} \]
\[ 0 = \text{searchers - free to wander, checking likely spots, continually "guiding" on the compass-bearer.} \]

b. This technique can be used in open grids with a number of independent teams equally spaced, or teams can work independently in any of a number of other search patterns.

c. To summarize Type II search commands, the usual sequence is as follows: The team is lined up in starting positions: First, verbal line count to check team personnel; Second, "All Ahead" plus line numbers in sequence; Third, proceed in formation approximately 1,000 feet; Fourth, "Halt" plus line numbers in sequence; Fifth, shouted line count up the line and back to the team leader; Sixth, full 30-second period of silence; Seventh, "All Ahead" plus line numbers in sequence.
8.7 **Type II - Area Identification**

a. In order to outline and define the boundaries of the sector of the area being searched, the team leader of the left and the end man on the right each carry rolls of colored paper tape, plastic marking ribbon, or string. A piece of the tape about twenty-four inches long is tied to a tree or bush at the start of the line advance and at intervals within sight of the previous two search parties in the area. Search team personnel should never second-guess the actions of a lost person who may be acting in an irrational manner. Usually, the guess will be wrong.

b. It is the responsibility of the Search Manager and his staff to determine how and where to establish a search pattern. It is the sole duty of the search team to carry out those plans. Ordinarily, a search for a lost person is merely a process of area elimination. The prime areas are covered first and, if efforts to find the victim are unsuccessful, secondary areas are covered in a widening scope, until he is located. How soon the lost person is found is determined by the skill of the staff in applying its past experience to analyze the situation and make the correct decisions regarding proper search procedure and search areas.
SIGN CUTTING IS IN, OTHERS ARE OUT:

THE BINARY SEARCH TECHNIQUE SAYS:
"The easiest way to find someone is... to determine where he isn't..."

Perifery search using track-traps and natural barriers to eliminate sub-areas.
8.8 The PRIORITY that the search is assigned dictates the strategy. As elapsed time increases, the relative urgency of the situation also increases. In the initial stages the urgency may have been low and the search manager more prone to use passive methods. As the search progresses, the need for more active methods increases. The best initial action plan combines the two modes commensurate with the needs of the search at hand. The methods should provide for the reduction of the search area while at the same time actively look for clues and the subject.

**HIGH PRIORITY (i.e., Time Critical, etc.) usually dictates more active measures**

*Resource application is also dependant on initial tactics. The search manager must decide whether his plan will be ACTIVE, PASSIVE, OR A COMBINATION OF THE TWO.*

9.0 **INITIAL RESPONSE (COMMITTING THE FIRST RESOURCES TO THE FIELD)**

9.1 These procedures are those immediate efforts in high probability areas to locate the subject (or clues) with a minimum of resources. As discussed in the previous Chapter on Probability of Area, the first problem is to establish search areas. Where the subject is most likely to be, then use CONFINEMENT tactics. Although the most effective initial response resources are all clue aware, some consideration must be given to possible conflicts which might arise in a given search area.

9.2 How does the resource function? It is important for the search manager to know how a particular search resource operate. A tracking team relies on subtle physical clues left behind by the subject, i.e., tracks, broken twigs, leaves, etc. The search dog relies on a cone of scent emanating from the subject in the field. It would be a waste of valuable resources to rely on a team of tracking dogs after an area had been systematically worked by a tracking team or numerous members of ground search parties. Fixed wing vs. rotary wing can be crucial in some terrain. Each type of initial response team has its advantages and should be applied to the areas that best suit their expertise. Proper application of SAR resources to field operations is the back-bone of effective search management.
The most effective initial response resources are clue aware.

- Human Trackers.
- Dogs (air scenting).
- Dogs (trailing, depending on weather, etc.).
- Trained Hasty Teams (clue conscious).
- Aircraft (looking for tracks, etc.).

The most effective initial tactics are:

- Binary Search (Perimeter cutting).
- Hasty Search.
- Confinement.
- Attraction.

9.3 Initial action resources should be used in the following order if possible, realizing of course that their effectiveness is dependent on planning and control by the search manager.

a. CLUE FINDERS

- These resources are called first and they respond quickly.
- They are skilled.
- They are small in number (logistic needs are less).
- Main function...to find clues.

Examples:

- TRACKING DOG
- VISUAL TRACKER
- INVESTIGATION TEAM
- DIRECTION FINDING (DF) equipment

b. CLUE/SUBJECT FINDERS

- Main function: to search areas as indicated by Clue Finders.
- They provide on-going information.
- They investigate possible routes or barriers to subject travel; subject attractions: further clues left by subject (this should help to further reduce search area size).
Examples:

SEARCH DOGS
HASTY TEAMS (CLUE AWARE)
D.F. EQUIPMENT
GRID TEAMS (CLUE AWARE)

c. SUBJECT FINDERS

- Deployed into segmented areas as determined by clue strategy.
- Should be able to search quickly and efficiently.

Examples:

GRID SEARCHERS
HELICOPTERS
UNTRAINED VOLUNTEERS

9.4 The search manager should consider several important points in applying initial resources:

| a. Consider all available initial resources (should be contained in a good preplan) and their capabilities. |
| b. What kind of training and how much have they had? |
| c. What can the resources provide in relation to what is needed? (technical expertise vs. clue awareness hasty teams) |
| d. If a particular resource is used, what feedback information can that resource provide that will be helpful to the on-going search planning? (If a resource simply reports that "they did not find the subject" they have not provided information (clues) that could lessen the search difficulty and may have, in fact, destroyed evidence.) |
10.0 **GENERAL PRINCIPLES OF APPLYING SAR RESOURCES**

10.1 The search manager should develop resources and also see to it that his resources are properly trained.

10.2 Know where outside resources are located and how to obtain their services as back-up.

10.3 Include all resources in a Preplan and how they will be used.

10.4 Match the resources and their capabilities to the needs of the jurisdiction and the search at hand.

10.5 Initial tactical actions of resources should be general and require minimum direction and control by the search manager.

10.6 The more diverse in skills that any resource becomes, the more useful they are.

10.7 As a search progresses, all resources gradually progress from independent strategy to strategy dependent on the search manager.

   a. Clue finders can work dependent under a general plan.
   b. Clue/subject finders will depend upon the search manager for periodic re-assignment and direction.
   c. Subject finders need detailed plan and firm control.

10.8 Effective communications for control and monitoring will directly effect a search managers decision to use any resource.

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**PERIMETER CUT vs. HASTY SEARCH**

<table>
<thead>
<tr>
<th>PERIMETER CUT</th>
<th>HASTY SEARCH</th>
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</thead>
<tbody>
<tr>
<td>• Search primarily for tracks.</td>
<td>• Search primarily for subject.</td>
</tr>
<tr>
<td>• Cut at right angles to route of travel.</td>
<td>• Follow route of travel.</td>
</tr>
<tr>
<td>• Weave around to pick best tracking ground.</td>
<td>• Take path of least resistance.</td>
</tr>
<tr>
<td>• Make continuous cut around an area.</td>
<td>• Check specific locations or routes.</td>
</tr>
<tr>
<td>• Concentrate on ground at your feet.</td>
<td>• Look all around</td>
</tr>
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</table>

**USE ATTRACTION**
10.9 Important Points to remember when trying to keep the search organization running smoothly with all resources.

a. Team efforts are more efficient and effective than the same number of individual efforts.
b. Team efforts utilize the "buddy system" with a safety factor not available with individuals.
c. Use a Chain-of-Command when dealing with organizations and include their leadership in regular briefings as well as search strategy formulation.
d. Make sure each resource has well defined and reasonable tasks to perform.
e. Never ask or allow an organization to attempt a function they are neither trained nor equipped to do, especially if there is any question of safety.

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SOME SEARCH AND INFORMATION THEORY DEFINITIONS APPROPRIATE TO OUR PRINCIPLES ARE:

Successful search missions are dependent on quick response, efficient searching and good management. Anything less could be called negligence.
"Now," said Rabbit, "this is a search, and I've organized it ---"

"Done what to it?" said Pooh.

"Organized it. Which means -- well it's what you do to a search, when you don't all look in the same place at once..."

--A. A. Milne, 1928

INTRODUCTION

This section discusses "tracking oriented" search techniques. To help explain what we mean by this, consider the following analogy. Suppose you are told that an unbroken string leads from some point near where the missing person was last seen all the way to his present location. How would you go about looking for the missing person? Probably, you would try to find and follow this string. You would walk a large circle around where the person was last known to be, hoping to intersect the string. Having found the string, you would follow it to the missing person, being careful not to lose it. The success of this plan would depend on how difficult it was to find and follow the string. Imagine your exasperation should you learn that 50 searchers oblivious to this string have already crisscrossed the search area, breaking the string into hundreds of pieces. This is about how the traditional method of line search or "gridding" looks to the experienced tracker. For in reality there does exist an unbroken string of footsteps leading from where the person was last seen to his present location. These footsteps are more or less visible, and frequently can be followed by an experienced tracker. Thus, by "tracking oriented" search techniques we mean search methods which attempt to find and exploit tracking clues to locate the missing person.
**A. SEARCHING**

The goal of searching is to find the missing person (the "subject") alive. On first thought the best strategy might be to have everyone out looking for the subject. However, it turns out that a better strategy is to have people gathering information, trying to find tracks, and confining the subject's movement, as well as searching. These activities, although not directly searching for the subject, do contribute to overall success by narrowing the area that must be searched.

The search techniques discussed in this section include fact finding, hasty search, tracking, confinement, sign cutting, and line search. Field assignments to searchers will change as the search progresses. This is because searches tend to follow a pattern that we might call the sequence of events on a typical search operation:

1. Problem reported to authorities.
2. Search teams alerted, agency investigates to determine urgency.
3. If urgent, agency mobilizes search teams.
4. Search teams transit to search scene.
5. Establish base camp and get organized.
6. Crews do fact finding, hasty search and tracking.
7. Additional crews do confinement, sign cutting, and more hasty search (and maybe line search).
8. Finding a clue focuses the search.
9. Subject is found and evacuated.
10. Crews return to base and then home.

In responding to a search, time can be very critical. Weather extremes, possible injury, and dangerous terrain all are potential reasons that the subject is missing. Survival time will be limited if any of these possibilities occur. The surest guarantee of a successful search is a quick response. For the individual team member this means:

1. Keep your gear ready to go (in the hut, if possible).
2. Be familiar with group equipment, how to set it up and where it is stored in the hut.
3. Practice search skills so you can carry out your field assignments quickly, yet effectively.

In many cases, by the time the teams arrive at the search scene, the subject has been missing overnight. Family and friends and the authorities have searched without success. The arrival of more people with radio communications permits an expanded and more thorough search to begin.
The first phase we might call the "build-up" phase. The first teams to arrive do not go into the field, but prepare for additional search teams by setting up base camp, gathering information, and planning what to do. During the "build-up" phase, the emphasis in the field is on taking short cuts to bring the search to a speedy and happy conclusion. Techniques used are:

**Fact Finding:** To collect solid information about the subject and about the search area on which to base an effective search plan.

**Hasty Search:** To rapidly check all known hazards, probable routes of travel and other places where subject is likely to be.

**Tracking:** To check the last known position thoroughly for tracks, and follow them to point search in the right direction.

As more searchers arrive and as the initial search efforts meet with no success, the search enters what might be called the "clue search" phase. Since short cuts have not worked, more systematic techniques are called for. These include:

**Hasty Search:** Continues and expands. Hasty teams check drainages, ridges, passes and shelters throughout search area.

**Confinement:** To detect if, when and where the subject leaves the search area.

**Sign Cutting:** To find subject's tracks somewhere in search area so that tracking can be employed.

Should the "clue search" phase fail, the search evolves to what is often called the "gridding" phase. Although clue search techniques may be continued, the main field technique used in this phase is:

**Line Search:** To methodically sweep the search area, sector by sector, using close or widely spaced lines of searchers depending on the terrain and vegetation.

Sooner or later the subject usually is located. After immediate first aid treatment is given, he must be helped back to base camp, and perhaps to medical aid. This is the "evacuation" phase, and may involve a "walk out", a "fly out", or a "carry out", depending on the terrain and weather and the condition of the subject.

Before going on to describe the search techniques, there are two important matters to discuss. These are setting up base camp, and the need to preserve clues.

**BASE CAMP:** Search base tends to be a very confused place for the first few hours. If you are among the first to arrive on scene, you may be asked to help set up base camp and get things going. Some of the things that need to be done are:
1. Set up the base radio and keep a communications log.

2. Sign in arriving search personnel, vehicles and radio numbers.

3. Get out maps and set up map table, chart the search so far.

4. Mark off areas that might contain tracks or other clues.

If you don't receive a specific assignment, get your gear ready and stay put. Do not wander around. It may take the operation leader some time to sort out the situation sufficiently to start giving field assignments. Curiosity and boredom may tempt you to go see how things are going. Don't! Stay with your team and wait for your team leader to return with something to do.

**CLUES:** A person missing overnight can easily travel several miles. This could be in any direction. The area to be searched may be as much as 25 square miles. Clues indicating which way the subject went can reduce the area to be searched down to a manageable size. **All searchers need to be "clue conscious", and avoid needless destruction of clues.**

Search teams arrive at the search scene in vehicles, equipped with four large track erasers called tires. And each searcher has two more track erasers at the ends of his legs. Be careful where you walk and drive within the search area. Try to go where your tracks will be clearly visible. If you don't see anything there except your own tracks, you can be reasonably sure the subject did not go there. If you do find tracks, circle them and report your find to base camp.

When traveling by vehicle watch the road for tracks. It might be necessary for someone to ride outside on the hood. Lost persons have been known to wander out onto a dirt road for a ways and then go back into the brush.

**B. FACT FINDING**

**One of the first things that needs to be done,** even while others are setting up base camp, **is to collect information.** The Search Manager will want to find out as much as possible about the missing person: trip plan, equipment carried, level of skill, physical and mental condition, habits, state of mind when last seen -- anything that might help to focus the search. Personnel will be assigned to talk to the family, friends and companions of the subject, and to anyone else that might know something useful.

Proper interviewing technique is essential to put the person being interviewed at ease; establish rapport, then ask your questions. It helps to pick an informal setting away from crowds -- a car, a picnic table, around a campfire. Avoid leading questions that may be answered simply "yes" or "no". You may unwittingly put words into the mouth of your witness. Have the witness describe in his or her own words exactly what happened. You must be patient, yet persistent. Keep asking questions until you get a satisfactory answer. People sometimes don't want to face the facts. Your purpose is to help them recall what they saw or heard or did.
Examples of the kind of information that will be of direct use on a search are:

1. Type and size of shoe worn by subject. Also, age and condition.

2. Subject's height and weight, his habits (gum chewer, smoker), his personality (cautious, adventurous), and his physical condition and general health.

3. Subject's departure point, destination and planned route of travel. (Check wilderness permits.) His previous experience in the wilderness and his degree of familiarity with the area. Also, what equipment he carried: food, water, tarp, jacket, map, compass, etc.

4. Weather conditions since subject's disappearance.

5. How much traffic (foot, horse, vehicle) is normal on the roads and trails in the search area. Have roads been dragged or graded recently. If not, can we do it?

Seldom will anyone know with any certainty what the subject's footprint looks like. In fact, the more positive a witness is of obscure details, the more skeptical the interviewer should become.

Information concerning the search area can be very useful. Does the surrounding terrain tend to confuse people, or funnel them into the wrong drainage? Are there any roads or trails not shown on the map? Or have trails been realigned? Have people gotten lost in this area before? Where were they found? Have any people staying around here seen or heard anything unusual?

C. HASTY SEARCH

Hasty search is the natural first response of people when they are looking for someone who is missing. It is also a very productive mode of search for organized searchers to use. It can be described as a rapid "once over lightly" search of the places where the subject is most likely to be. At the same time, hasty teams gather valuable information even if they do not find the subject.

OBJECTIVES: Hasty search has two major objectives. One, to end the search quickly by looking in the most likely places first. Hasty teams will also search danger spots, not because they are so likely to contain the subject, but because if the subject is there, his survival may depend on being found very quickly. Two, in case the hasty search is not successful, the information gathered by hasty teams can be used to help plan later search efforts. Also, any non-searchers in the search area can be advised that someone is missing. They then become part of the confinement effort if they are willing to help.
TECHNIQUES: Hasty teams usually consist of 3 to 6 searchers. If these searchers spread out several hundred yards apart, a hasty team can quickly cover a drainage or a ridgeline. In areas of dense vegetation, searchers should remain within earshot of each other. In class 3 terrain, rope teams should stay together.

Keep in mind that you are searching for a live and conscious person, who will respond if he hears you. Whistle, call his name -- then stop frequently to listen. Look behind you often, and to both sides. Binoculars are handy for scanning cliffs and the far sides of canyons.

Hasty searchers need to be "clue conscious" as well. Look for tracks anywhere they would show clearly -- sandy or muddy stream bed, dusty road or trail, or snow. If you find any tracks, mark their location with streamers and report to base camp. Be alert also for other clues -- food wrappers, discarded equipment or clothing, campsites. Any of these can refocus the search.

Hasty teams need to be prepared to spend the night out. Taking the time to return to base camp for the night can waste one-third to one-half of the available search time. Also, hasty teams camped out with a warm inviting campfire may find the subject wandering in to join them. Searching at night is also possible if the terrain is not too hazardous.

Frequent assignments for hasty teams are to check: (1) hazards: cliffs, mineshafts, rapids, crevasses, anywhere the subject might be trapped or injured; (2) shelters: cabins caves, hollow trees, places out of the elements where the subject might be holed up; (3) routes: trails, stream drainages, fire roads, knapsack routes, power lines, ridges, couloirs, canyons, any route of travel that might take the subject away from searchers, (4) registers at trail heads and on peaks or passes.

Hasty teams should stop to talk to the people they meet. Give a description of the subject. Ask them if they have seen anyone matching the description, or know anything else useful. Where have they been, and for how long? Ask them to notify search base if they do learn anything important.

D. TRACKING

WHY? Tracking involves following the trail of "footsteps" left by the subject. Some foot tracks will be big, obvious prints. Others will be scarcely visible, marked only by what trackers call "sign". A scuff mark, a broken twig, or a stone pushed into the dirt may be all there is to indicate a track. Patience, sound thinking, and a practiced eye are the ingredients that make a good tracker. Not everyone is so inclined. So why teach tracking to all team members?

Tracks are the most numerous clues in the search area. Once found, tracks may lead right to the subject, or at least point the search in the right direction. The more eyes looking for tracks, the more likely it is that tracks will be found. All searchers -- not just trackers -- need to be "track conscious". Especially, this is true of hasty teams, who often are the first (and perhaps only) searchers into much of the search area.
Beyond this, searchers need to be able to describe and evaluate any tracks they may find. Otherwise, the trackers will be run ragged checking "hot leads" that turn out to be bear tracks, or tracks weeks old, or 5 inches too long. Several days of training are generally sufficient. Additional practice, of course, adds to one's skill and value on a search. Reliable sign cutting in tough ground seems to require many hours of practice. The border Patrol says it takes 1000 hours to rank as an expert tracker.

**RATING:** Within our group we classify tracking difficulty (and rate tracker skills) on a scale from 1 to 6 as follows:

- **T1: Very Easy** Perfect prints, clear enough to make out labels, in mud, beach sand, or ideal snow.
- **T2: Easy** Whole, but fuzzy prints, such as are found in our surrounding desert or in summer snow.
- **T3: Moderate** Indistinct prints that are harder to see because of coarse soil or vegetation or poor lighting. Novice trackers may have difficulty.
- **T4: Hard** Partial prints that are very hard to see, obscured by hard ground or much vegetation or flat lighting. Identifiable as human, but lacking positive ID.
- **T5: Severe** No tracks, just indirect evidence called "sign". Many people will say that tracking is impossible. Practice with the step by step method makes it possible.
- **T6: Very Severe** Harder than T5. Only one tracker on our team is this good. Ask him.

**OBJECTIVES:** As a search technique, tracking has three objectives:

- To determine the track ID of the subject.
- To establish a direction of travel away from the last known position of the subject.
- To track down a hiding or otherwise unresponsive subject.

Interviewing usually will not produce an accurate picture of the subject's footprint. So, one of the first assignments for the trackers will be to check the places where the subject was known to be, in hopes of figuring out which track belongs to the missing person. Seldom is the problem one of too few tracks. Normally, there will be a maddening plenitude of tracks to sort out. If the subject's track can be identified, the trackers can attempt to follow it. Sign cutting teams will also have a description of what they are looking for.
Seldom will trackers actually track down the subject. More often a hasty team or a helicopter vectored to the subject by the tracking team will find the missing person. Once in a while the subject will hide from the searchers. This is common with small children. One very real possibility that must be considered is that the subject is unconscious and cannot respond to the calls of the searchers. In these cases, tracking (or the use of dogs) is about the only way to find the subject alive.

**STEP BY STEP METHOD:** Tracking (or trailing) has been used for centuries by hunters, and for many years by search and rescue teams. However, the step-by-step method of tracking taught by Ab Taylor and Jack Kearney of the border Patrol is comparatively new. This method, based on the simple idea of prediction, makes tracking faster, yet less prone to error.

**Trackers follow the tracks one step at a time, predicting from the last step where the next one should be.** This is possible since a person’s stride (distance between steps) typically does not change much as he walks. Use of a tracking stick, (Ab Taylor calls it a "magic wand"), makes this method of tracking quite fast. A tracking stick may be made from any stout stick (pool cue, child’s ski pole, wooden dowel) about 3 feet long. Use rubber bands or O-rings to mark the stride and track length on the tracking stick. With the stick marked for track and stride length, it is possible to work from either the heel or toe of one print to find the next.

Holding one end of the stick on the track, swing the tip so that it sweeps an arc in front of you. Concentrate on the ground under the moving tip. That is where the next heel print should be. This is faster than scanning the entire area ahead of you. Some rules of thumb that may help speed your tracking: The next print probably will be in line with previous ones. Right prints tend to be a little to the right, and left ones to the left. Remember whether you are looking for a right print or a left. It helps to mark each track as you find it to indicate right or left. Scratch a U-shaped mark behind the heel print. Put a "tail" as shown to indicate right or left. If you encounter some tough tracking, circle the last good print you are sure of, so you can come back to it if necessary and start over.

Tracking technique is best developed by practice. There are however, some helpful hints essential to good technique. These concern use of light angle, use of logic and learning how to distinguish animal from human tracks. These are discussed in the next three sections.

**LIGHT ANGLE:** A little practice will convince you that the best sun angle for viewing tracks is to face the sun and put the track between you and the sun. A low angle of illumination (early morning or late afternoon) is best. Shadows are deeper and contrast is usually greater. Midday in summer is the most difficult time to track because of the lack of shadow to outline prints or highlight patterns. It may help to have one tracker shade the track while another uses reflected light at a low angle to examine the track. Overcast days with very "flat" lighting are poor for tracking.
LOGIC: Tracks are put down in layers, with the most recent track on top. Logic is nothing more than using this fact to work out the time sequence of several layers of tracks. And perhaps deduce which track belongs to the subject. Here, a footprint is on top of a vehicular track. There, a second track is under the same vehicle track. A witness states that he drove in here after the subject was reported missing. Conclusion, the first track does not belong to the subject. The second is a possibility.

The combination of urgency factors will help determine not only how quickly to respond, but the level of response. Some kind of response should always happen immediately. SEARCH IS AN EMERGENCY— even if it is no more than stepping up the planning for the increased potential for a more serious problem.
HUMAN PRINTS: It can be difficult to tell animal tracks from human tracks. One of our veterans spent hours doggedly following some bear tracks that he thought might be the subject. Several hints to help you. Very few animals weigh as much as people, or have feet as big as people. Also, extraordinarily few animals wear boots. So when examining a track, look for evidence of weight -- surface compression and compaction, stones or sticks pushed into the ground. Look also for disturbance over several square inches of surface, and for straight or curved lines that indicate the edge of the sole or heel. Use stride to tie several tracks together. Disturbances spaced 28 to 36 inches apart are probably adult tracks. Of course, if the subject is a small child, all these distinguishing features become much harder to see.

SIGN: Tracking on very hard ground, or over rocky areas, or on pine needles is difficult, but not impossible. Every step causes some disturbance to the ground surface and vegetation, some evidence to indicate that a person walked there. Trackers call this disturbance "sign". Learning to see and to correctly interpret sign is the essence of becoming a tracker.

Some examples of sign are listed below. This list will help get you started, but really there is no substitute for practice.

1. Scuffing of the surface, changing its color slightly.

2. Sticks or stones pushed into the ground.

3. Sticks or stones overturned, or kicked from their sockets.

4. Smashed plants or rabbit pellets, or broken stems or crumpled dry leaves.

5. Compression (flattening) of natural surface roughness, causing the step to be more shiney.

6. Grit embedded in the under surface of leaves, or carried onto an otherwise bare surface.

7. Leaves turned upside down, or grass pushed over or entwined in one direction.

Being able to tell the age of tracks can be very helpful. In the desert, unfortunately, tracks can remain new looking for weeks, only to be aged in a few minutes by strong wind or rain. The recovery rate of vegetation after bruising or breaking may be a more reliable guide to age, but we have not gathered data on this.

On search it can be quite important to be able to tell if tracks were made that day or have been there overnight. One clue is that tracks made the day before are apt to have small animal or insect disturbance on top of them.
TRACKING TEAM: A tracking team usually consists of 3 trackers: point and two flankers. The point tracker is in charge of the team, and has responsibility for the following tracks. The flankers assist the point and also check to see if the subject might have changed direction abruptly, or if any foreign tracks cut across the tracks being followed. Also, the light angle may be more favorable for one of the flankers than for the point tracker. Flankers position themselves to either side of and slightly behind the point. They are careful not to over run the tracks. Control is essential. No one should advance until the point tracker marks the next track. Any questionable tracks should not be marked until all 3 trackers agree. One flanker should act as navigator and radioman for the tracking team. He should note where the team is going, as it is possible to get disoriented while intently following the track. Positions should be rotated often to avoid fatigue, and mistakes.

TRACK DESCRIPTION: If you do discover a suspicious track while searching, radio the following brief description to base camp: your location, track heading, track length, basic type of print, and stride. Base camp will assign an ID number and request more detail if the track appears to be a hot prospect. Otherwise, draw a sketch and be prepared to give a complete description later.

When describing a track over the radio, you must do so in a way that the person listening will draw the same sketch as you have drawn. Before you begin, look at several tracks to get the best composite description. Be honest about what you can see, and about what you cannot see, but merely surmise. Then proceed from the general to the specific in your description.

1. First, describe the ground surface. This gives an idea of how much detail you are likely to see.

2. Give the basic type of shoe: flat or heel-and-toe. Is toe pointed or square? Is the sole plain or is there a pattern? Is there a border? Nail holes?

3. If there is a pattern, is it regular or irregular? Describe it: honeycomb, bars, wavy, checkered, etc.

4. Give the size: length and width or print, length and width of heel (if any), stride.

5. Finally, describe the features that make this track different from others like it: cuts, worn spots, or heel plates. Describe how subject walks: toes in or out, deep heel or toe dig, foot dragging or twisting.

Our team uses a track description form to help make sure that all pertinent information is recorded about a track. The items to be reported to base camp initially are marked with an asterisk.
Track Identification

When you find a track during a perimeter cut or a hasty search, you should draw a detailed sketch. You may have to describe the track to base or to another tracking team over the radio. If so, you should describe the track in such a way that anyone listening can draw the same sketch as you have drawn. The following scheme represents our current thinking about how a track can best be described over the radio.

1. **Right or left**
   Are right and left tracks mirror images?

2. **Basic type**
   Flat (no heel) or distinct heel and toe?

3. **Shape**
   a. Toe: pointed, rounded, box or square shaped
   b. Heel: leading edge straight or curved
   c. Instep: high or low

4. **Size**
   a = overall length
   b = sole width
   c = heel width
   d = heel length (if any)
   e = stride (heel-to-heel)

5. **Sole Pattern**
   a. Border, nails or stitching, labels, trademarks, numbers.
   b. Pattern type: Plain (no pattern), regular, irregular, or mixed.

   **Regular**:
   - bars
   - broken bars
   - ripple
   - tire tread
   - fishescale

   **Irregular**:
   - circles — concentric, suction cup, semicircles or arcs
   - bars — straight or curved, longitudinal (lengthwise, vertical), transverse (crosswise, horizontal), diagonal
   - chevrons
   - diamonds
   - lugs or stars

   **Mixed**: regular and irregular

   **NOTE**: A fine pattern may appear to be plain if the ground surface is too coarse. Be sure to state number, size and location of irregular pattern features.

6. **Heel Pattern** (if distinct)
   Pattern, nail holes, slanting or rounding edges.

7. **Unique Features**
   Cuts, worn spots, heel plates; anything that makes this print different from others like it.

8. **Gait**
   Toes in or toes out; deep toe or heel dig; possible limp.

The following types of tracks occur often enough that we have named them. As long as everyone uses these names to mean the same thing, much time can be saved in describing a track.

**Sneaker**:
   Molded heel and toe, usually plain (because fine pattern doesn't show), or else fine regular pattern without any border. Subtypes: deck shoe, tennis shoe.

**Gym shoe**:
   Flat (no heel); coarse pattern, usually irregular geometric shapes with definite border.

**Lug boot**:
   Separate heel and toe; coarse lug and star pattern. Subtypes: Montagna Vibram, Security Vibram, Klettershuh.

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**YOU ARE WORKING FOR THE LOST SUBJECT**

**Assigned identification**
JUMP TRACKING: Once a tracking team is following the trail of the subject, and a direction of travel can be determined, the tracking team should radio a magnetic bearing (compass heading) back to base camp. Base camp then can dispatch a sign cutting team to cut in front of the tracking team. Usually two teams are sent out on the given bearing, beyond the tracking team. They turn back-to-back and cut a perimeter at right angles to the track. The reason for attempting to jump track is that the first tracking team may encounter tough tracking. Valuable time can be lost, waiting for the team to track down the subject.

If one of the perimeter cutting teams finds tracks, they begin tracking. As soon as they can confirm a track heading, they radio it to base camp. The entire procedure can be repeated to try jumping the tracks again. If enough trackers are available, the first tracking team continues to track until it hits the perimeter cut. This confirms that the second tracking team is on the right track. If there are not enough trackers to do this, the tracks are clearly marked where the first tracking team stopped, so that they can return if necessary.

To be successful, this technique must be done carefully. It is essential that the sign cutting team know exactly what track they are looking for. If possible, base camp should consider using one or two of the trackers on the tracking team as sign cutters, and replace them on the tracking team with others who then can also become familiar with the track.

E. CONFINEMENT

OBJECTIVE: The purpose of confinement is to limit the search area, should the clue search phase fail. A healthy, but disoriented subject can keep moving for several days. If no attempt is made to confine his movements, he could wander miles from his last known position. Confinement techniques may not stop the subject, but they will detect if, when and where he leaves the search area. If the subject crosses a search perimeter, the search can be restarted from there. Also, confinement techniques work equally well within the search area to check for the subject wandering from one drainage or trail system into another.

TECHNIQUES: Confinement teams may have to stay at their locations until the search is over. They will need to take camping gear and food and water for several days. Confinement techniques discussed here include blocks, lookouts, track traps, patrols, string lines, and attractions.
BLOCKS: The team camps at a roadhead, a major trail junction, the mouth of a canyon, an access road, or any possible exit from the search area. This guards against such possibilities as the subject hitchhiking home, or wandering the wrong way on a trail. A team of two or three is sufficient. At least one person should be alert at all times. Do not assume the subject will stop just because he sees your camp. He may be convinced that his car is just around the next bend.

LOOKOUTS: The team positions itself on a prominence, overlooking as much of the search perimeter as possible. The team reports to base which routes it has under surveillance, and any gaps in the coverage. Lookouts frequently are also radio relays.

TRACK TRAPS: A track trap is a band of ground that will easily show tracks. Examples of natural track traps are steep banks of loose dirt, shoulders of dirt roads, broad shallow streams, and snow banks. Where natural features are inadequate, a track trap can be manufactured by dragging the area clear of debris and digging up the surface. A team patrolling the exit routes from the search area can tell if the subject has crossed one of these track traps. Patrols must be on a regular schedule.

PATROLS: Teams in vehicles can patrol the roads in and around the search area looking for the subject or his tracks, and interviewing people they meet. They might also check track traps, resupply blocking teams, or shuttle other searchers to assignments.

STRING LINES: Where dense brush or timber prohibit the effective use of tracking and sign cutting techniques, string lines can be used to create man-made barriers. Tags placed at intervals on the string line indicate the direction and distance to base camp, or to the nearest block or road patrol.

ATTRACTION: The string line is one form of attraction. It helps the subject help himself to safety. Other attraction methods are possible. Leave a note on the subject's car; tell him he is the subject of a search and ask him to check in at base camp. Notes may be placed at trail registers and at shelters. Frequently, a lost person is found when he encounters a hunter's camp or hikers on a trail. Blocking teams can keep a campfire going all night to attract the subject. Smoke signals during the day can serve the same function.

F. SIGN CUTTING

Finding the first track can be much harder than following a set of tracks. The technique of searching for tracks is called sign cutting, or track cutting, or perimeter cutting.

OBJECTIVES: Sign cutting is employed for several reasons.

1. To find the subject's trail so that tracking may be used to narrow the search.
2. To rule out portions of the search area without having to search inside them.

3. To deduce the track ID of the subject if this cannot be done earlier in the search.

A comment about the second objective is in order. Sign cutting can be used to eliminate portions of the search area from consideration if no tracks are found crossing a perimeter cut around the sector in question. In easy tracking terrain this will be faster (and more effective) than hasty searching the inside. Sometimes the best way to find someone is to first find where he isn't. If a track is found crossing a perimeter cut, the search has been narrowed from a possible 360 degrees down to less than 15 degrees, cutting the search effort by a factor of 24.

**TECHNIQUES:** A sign cutting team **consists of from 2 to 6 people.** More people give a higher confidence to the cut, but mean fewer teams. It is best if the sign cutters are experienced trackers. The team members walk abreast, spaced several feet apart. Their combined swath then will be at least 4 to 6 strides wide. Exceptions to this would be cutting along a dirt road or a stream, where sign cutters would go on both sides.

The team should stay together and exchange information. All team members may be needed to properly evaluate a clue that one has found. When one sign cutter crosses a set of tracks, other team members should also. If they don't cut any tracks or sign, this is significant also.

Sign cutters need to know what to look for. Based on the age, height and weight of the subject, and an idea of his footwear, many tracks can be eliminated quickly as possibilities. But as a general rule, sign cutters should be suspicious of ANY lone set of tracks close to the right size leaving the prime search area, whether they match the description of the subject's track or not.

Record all tracks found: description, location, and heading. Report this information to base camp, and make a sketch if the track is possibly the subject's. Flag locations of these tracks. Your reports together with other sign cutting teams' reports may be used to piece together what happened. One of the track reports is bound to lead to the missing person.

Sign cutting must be done as carefully as tracking. Stop often to test the ground. Walk normally across it. Come back and examine your tracks. Based on the subject's weight compared to your weight, judge how well his tracks would show up. Use light angle to your advantage. Cut into the sun. View the ground from several different angles. Look around and behind you as you go. Stay alert. Fatigue can be a very real problem, since you never know if there are tracks to be found or not. If you do find something, you may be reluctant to believe it. Remember: if you find no tracks, you will go back to base camp and report that the subject did not cross your perimeter. Be sure you are right.
Choose the best tracking ground you can find. This will maximize your chances of seeing any tracks if they are present. The shape of the cut is not important, so long as there are no gaps. On tough ground you may have to loop back and cut again to be sure. If you cannot avoid leaving gaps in the cut, be sure to flag them and report them to base.

Use available natural terrain features, such as track traps or barriers. Examples of track traps are soft dirt areas, dusty roads, broad muddy stream beds, soft snow fields, and even thick grass. Examples of natural barriers are cliffs, deep fast-moving streams, or impenetrable brush.

If you do find tracks that should be followed, check with base camp to see what to do. You may be directed to begin tracking, or base may dispatch another team to do the tracking while you finish your cut.

It should be apparent by now that sign cutting differs from hasty search in several important respects. First, when sign cutting you are searching primarily for tracks, and only incidentally for the subject or other clues. Tracking expertise is highly desirable. Second, you cut across the subject's presumed route of travel, and do not follow it. This is to be sure of cutting tracks without destroying them. Third, you weave around to pick the best tracking ground, instead of taking the most obvious or direct route. You avoid well-traveled trails (too many tracks), rocky outcrops (too hard), and screen slopes (too soft). Fourth, you cut carefully and with no gaps, rather than go quickly to specific locations, or follow certain most likely routes.

**G. LINE SEARCH**

The clue search techniques discussed so far -- hasty search, tracking, confinement and sign cutting -- will succeed in the great majority of searches. But occasionally, there is no alternative but to fall back on the technique of last resort, line search, also called "gridding".

**OBJECTIVE:** The objective of line search is to locate the subject or clues when other search methods have failed.

**TECHNIQUES:** A line search team consists of 4 to 10 searchers. They line up and walk abreast through the area to be searched. The spacing between searchers depends on the terrain and vegetation and on the level of thoroughness desired. Three spacings are used.

1. **Voice:** Searchers maintain voice contact, but may not be able to see each other. (This is similar to a hasty sweep.)

2. **Visual:** Searchers maintain visual contact. This is usually the best compromise between quick coverage and search thoroughness.

3. **Eyeball:** Searchers walk shoulder to shoulder, perhaps crawling on hands and knees. This is a fine-tooth comb sweep.
All members of a line search team should walk at a moderate pace so that no one gets ahead or falls behind. Otherwise, gaps in the line invariably develop. Team members should "guide right" or "guide left", as instructed by the team leader. "Guide right" means that each searchers must adjust his pace and direction of walking to maintain the proper spacing with the person on his RIGHT. If that person speeds up or slows down or veers to the left or to the right, you must do the same. "Guide left" refers to guiding on the person to your left. You should know the names of the searchers on both sides of you. Talk to them. Know where they are. Maintain voice, visual or eyeball contact as instructed. Wear your orange shirt, even on hot days, so that you are visible. Frequently, MRA searchers are interspersed with untrained people to perform a line search. Be sure these people know what is expected of them.

The spacing you are to maintain is only an average spacing. Rove around in your assigned corridor to look more closely at brushy areas, logs, piles of rocks -- areas where the subject might be concealed. Stay alert and keep a positive mental attitude. This is very hard, but also very important. No one else in the search line will catch the things that you miss.

Look around and behind you often. Viewing things from several angles doubles your chances of finding something. Be alert for tracks and other clues, even though you are primarily looking for an unresponsive subject. After a search line has trampled an area, any tracks are gone.

The search line guides on one end person, who follows a road, a stream, a ridge, a previously marked sweep boundary. On the other end a searcher marks the end of the current sweep. Tie streamers so that from each one to the next two are visible. The staring point and the end of each sweep should be marked and tagged with the team radio number, the spacing used, the date, and the grid ID (if any). Turn a copy of this information into base camp, along with an estimate of search thoroughness. Any clues found should also be tagged, and their location flagged.

Line searchers should realize that they will not reach 100% thoroughness. Nor will they always cover the whole area assigned to them. They should report to base camp an honest estimate of the area covered and their chances of success.

Contrary to tradition, search lines should be short (4 to 6 people), and line spacing should not be varied during the sweep as terrain or vegetation change. Longer lines waste much time in getting organized and in regrouping in dense vegetation or rough terrain. And gaps are almost inevitable. Varying the spacing, although more efficient on that sweep, makes succeeding sweeps less efficient, since the wiggly boundary causes much shifting right or left, compared to forward progress. Too, the boundaries are harder to mark and to follow.
Experimental data, and mathematical analysis, suggest that multiple sweeps of an area at wide spacing is preferable to a single sweep with tight spacing. The figure below, based on experiments conducted by Washington Explorer Search and Rescue, show detection probabilities for four different search strategies. Multiple sweeps with wide spacing achieve a high probability of detection with much less effort. More importantly, the probability of early success is higher. This reasoning, if carried to its logical conclusion, suggests that the best strategy is hasty search, that is cover lots of area very quickly, then cover it again.

H. NIGHT SEARCH

Many searches begin or must continue in the dark. Although searching in the daytime usually is easier and more productive, it is possible for the trained person to search at night. Since lost persons normally stop at night, searchers utilizing the nighttime hours have a chance to catch up with the subject. While it is probably true that night searching is not as effective as daytime searching, not searching at night is even less effective.

ORIENTATION: The first problem for the nighttime searcher is to determine his location. Visual clues often are not available. The searcher should study a map of his intended route in detail before leaving base camp. Changes in slope, stream crossings, trails and changes in vegetation all provide clues to maintain orientation. Keep track of your position. It is much easier to continually plot your location than to re-orient yourself if you become lost. Compass headings are best followed by picking out a large feature on the horizon or a star and heading toward it. Attempting to travel while looking at your compass usually takes you in a large circle. Under extreme circumstances it may be necessary to send a team member ahead to the limit of visual or voice communications and direct him to the proper heading via compass. By stopping and turning off headlamps until yours eyes adapt to the dark, larger terrain features can be distinguished by star light. But depth perception is poor at night. It is surprisingly hard to judge dropoffs and distances in the dark, so trust your map.

TRACKING: A flashlight provides adequate illumination for tracking and sign cutting. The light is not as good, but it is under the control of the tracker, and can be positioned to best advantage. Hold your light low and to the side to accentuate shadows. The small area illuminated focuses your attention. Tracks are more easily detected. But because tracking requires intense concentration, it is easier for trackers to become disoriented at night. For this reason one team member should be assigned the task of navigating. Fatigue can be a problem. If the tracking is very difficult, it may be better to wait for daylight rather than lose the track.

HASTY SEARCH: Road and trail searching can proceed unhindered by darkness. Cross country travel may also be feasible, depending on the technical difficulty of the terrain. Sound travels well at night, so calling to the subject and listening for a response is very important. Flashlight signals or signal fires may also guide you to the subject, or attract his attention.
CONFINEMENT: Darkness will usually stop the subject, giving searchers valuable time to move into position to confine his movements before dawn. Bumper-mounted lights work well to cut for tracks on dirt roads at night. Campers and hikers in the area can be approached at night and advised to keep their eyes and ears open the next day.

I. SPECIAL SITUATIONS

DOGS: Two basic types of dogs are used in searches: trailing dogs and search dogs. While search dogs alert on any human in the area, the mantrailing bloodhounds follow only the one scent that has been given to them, and are not distracted by the fact that other people may be in the area. Both types are capable of working in a variety of situations and conditions.

Trailing dogs are usually bloodhounds. They work in a harness, on leash, with a handler. Since body scent hangs in the air for some time before settling to the ground, many bloodhounds trail with their heads held up on fresh trails; they do not always have their heads to the ground, as is popularly believed. They must be started from a scent article, which is ideally an article of clothing the person has worn, but may be anything the subject has touched, such as the seat of a car, the tool he may have been working with, comb, bedding, once even a tuna fish can the man had eaten from. The important thing is that it should not be handled by other people; let the dog handler obtain the article, if possible; otherwise, pick it up with a fork, stick, pliers, etc. and put it in a clean plastic bag. NOT A GARBAGE BAG, which may be deodorized, and so spoil the scent.

Bloodhounds have trailed successfully in all kinds of weather, after hours of rain, three feet of snow, or any hour of the day or night. Night searches are often easier, since the humidity will intensify the scent.

Search dogs are usually German Shepherds, but other breeds work well also. They work off lead, roving about in a sweep pattern along the direction traveled by their handler. They are air scenters, trained to home in on any human smell they find. They do not need a scent article. They can be used later in the search, as well as early, since they work from the airborne scent emitted from the subject, and not the ground scent. Search dogs work downwind from the area to be searched. They work as effectively at night.

ELT SEARCH: All private aircraft are now required to carry an Emergency Locator Transmitter, or ELT. The ELT is activated upon impact if the plane crash lands, and transmits a signal for days. Our Group has an electronic direction finder that can be used to home in on the ELT signal in order to locate the wreck. Normally, downed aircraft searches are handled by the Civil Air Patrol or by sheriff’s aero squadrons. We would be called to search at night or in foul weather when airborne search is too risky.
An ELT search team of 3 or 4 people, equipped with the DF (direction finding) unit, are sent to try to pinpoint the location of the source of an ELT signal. Two teams are preferable, since they can then each take readings and plot the intersection of their bearings. ELT signals travel much the same way as light travels, but can be reflected by hills and cliffs, and distorted by metal structures and power lines. To avoid "shading" and "multipath" reflections, stay as high as possible on ridges and peaks. Walk around peaks to check the signal from several directions. Take several bearings from nearby locations and average the readings. Try to get bearings accurate to 1 degree. Do not try to hom in on the signal by following it over hill and dale. But take bearings from high points and plot a fix. Then move to this location and take new readings. Use signal strength as well as direction. When the signal is very strong you are close. A cheap DF unit can then be used. Thus, the primary DF unit may not even get to the wreck, but only direct another team to the site.
The ABC’s of Dogs in Search and Rescue
By: Jeff Doran and Marcia Koenig, c. 1989

To the Agency:

1. Know Your Resource

The most effective way to use any resource is to be familiar with it beforehand. It is reasonable to ask a dog resource for general information about capability, experience, and availability.

2. Know How to Use It

When calling upon a dog unit the agency should know the difference between a tracking/trailing dog vs. a searching dog. Whether to use them early or late in the search, what type of weather, and other circumstances of the search all have a bearing on the type of dog used. These subjects will be covered in the following paper.

While a SAR dog unit is usually self-sufficient, agencies should be prepared to provide some assistance and communications backup.

3. Expect Competence

In this country there are nearly 100 organized dog units and a very large number of individual handlers and dogs. The working quality of these dogs may vary considerably based on their experience and expertise. This poses a problem for the agency deciding who or what to use.

Since it is not possible to evaluate dog teams without several years of exposure, it is necessary to use other general criteria. These are the very least that the agency should expect from a person or persons who profess to be competent in search and rescue dog work:

1. The handler should have appropriate dress, foot gear and survival gear for the weather and terrain, demonstrating skill as an outdoor person and familiarity with elementary SAR procedures.
2. A unit should have an operational structure, adequate base camp support and a communications set-up.
3. The dog(s) should be an eager worker with an agreeable temperament and good manners.

The ABC’s of Dogs in Search and Rescue. The purpose of this paper is to clarify the basic concepts of dogs in SAR work. That is, “Application” to a particular mission, “Benefits” derived from the resource, and how “Coverage” can be estimated.

Application and Scent Theory

The traditional dog for search and rescue is the tracking or trailing dog trained to follow the missing person by scenting on or near the footsteps. In the past three decades, the searching dog, trained to hunt the air currents for human scent, has grown in popularity.

It is important to understand how basic body function is the link between SAR dogs and the subject of the scent. The human body gives off a constant stream of scent, much like campfire smoke. Skin surface alone has some 2 billion cells, of which 40,000 cells are being shed each minute. These cells that are shed carry along bacteria and body secretions. The growth of bacteria on the cells produces a vapor that is the detectable odor of human scent. As the cells are shed from the body they are carried by air currents. They lodge in vegetation or percolate through rubble, water or snow.

Ground scent is made up of two components - crushed vegetation where the person has waled, and the shed human cells.
**#1 Tracking Dog diagram**

**Tracking Dog:**
The tracking dog follows the crushed vegetative scent of the subject's footsteps. The dog should not vary more than one or two feet from these footsteps, despite the wind conditions. He is very characteristic in the head down posture, sniffing at the ground for the evidence. The basic orientation of the dog is to the footsteps and not the human scent.

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**#2 Trailing Dog diagram**

**Trailing Dog:**
This dog is oriented to the cells which have fallen to the ground along the person's route. The dog may well be working some distance from the actual footsteps. He will appear to shortcut some corners and overshoot others. Some dogs will even stop and sniff at leaves of vegetation two or three feet off the ground. Some dogs will move from the actual steps to an outer boundary of cells and back again, a combination of tracking and trailing. Bloodhounds are the traditional picture of the tracking/trailing dog.
Air Scent or Searching Dog:
This dog is usually oriented to airborne cells. His head is held high, and he looks as though he is searching the air currents like a hunting dog finds game. He may follow a trail if one is available. Or conversely, he may leave a trail and move in on the airborne scent. But the basic orientation of the dog is to the air borne scent of the human.

Now let’s look at what happens to scent over a period of time and how the different types of dogs may be best utilized.

In illustration #4, the route taken by the subject to his present location is shown and represents the pattern of mixed vegetative and human scent created by the subject passing along the way. Also shown is the “cone” of airborne scent developing downwind from the subject’s location. The starting point and the ground scent are the two most important factors for the tracking/trailing dog. The dog is brought to the Point Last Seen (PLS) to begin working the ground scent. In order to discriminate the subject’s odor from other conflicting odor, the dog is given a scent article.

Consideration must be given to the conditions under which a tracking/trailing dog can be effective. The ground picture of scent will only remain for a finite period. It is influenced by the length of time before the dog is brought in, the prevailing weather (extreme heat or rain are detrimental), correct identification and preservation of the PLS, and the availability of an unlaunched and carefully preserved scent article.
The searching dog is less affected by the factors that govern the tracking/trailing dog. In illustrations #4 and #5, note that the airborne scent around the subject is increasing with the passage of time while the ground scent is diminishing. Illustration #6 shows how the wind carries the scent. A searching dog could be worked across the air currents and into the wind to detect the scent cone even when the ground scent has disappeared. They may be adversely affected by extreme heat with no wind or a heavy downpour. A searching dog is best used to search an area of high probability as opposed to starting at the point last seen. Through coordination of search areas assigned other SAR units, these dogs can be easily merged into the overall search plan. Scent articles are not mandatory for the searching dogs because the dogs are trained to find the source of any human scent. However, the dog handler should be advised if one is available.

Benefits

Dogs are most valuable as an early response resource. A tracking/trailing dog may give a direction of travel, while a searching dog provides large search coverage. Air support is a valuable complement to the use of dogs. A helicopter can be used for transporting the trailing dog to the search site. If the dog indicates a direction of travel, the helicopter can be used to search the area of highest probability, without disturbing the dog.

A searching unit of four dogs and handlers, with gear, fits easily aboard the “Huey” type chopper. For use in missions from a remote base camp, (i.e., mountain-side or wilderness area), searching dogs should be considered as an optimal resource, requiring only minimal assistance in transport or other facilities.

When night searching, dogs should be considered a primary tool. A human’s impaired vision severely limits the ability to search and navigate at night. A dog’s mobility is not affected, and scenting conditions are enhanced because scent dissemination from the subject is increased by the temperature difference between a warm body and a cooler environment.

A subject that is evasive or unresponsive should be considered in terms of their detectability. A frightened child will seldom be easy to spot. Detection by air scenting dogs, however, will not be strongly affected by a subject who is hiding, nor one who is covered with leaves or light snow.

As a hasty team resource, searching dogs and handlers can be further defined as clue/victim finders. That is, the search director should expect ongoing information from the handler that is important to the developing search plan. It is not simply a matter of finding or not finding the subject; the handler should provide other types of information that can be useful to the search director such as terrain evaluation, visual track awareness, and victim behavior. Given an area to search, the dog handler needs to be aware of what natural routes (drainages, old road grades, etc.) are available to the subject. The area may contain barriers to certain directions of travel. Frequently the trail system will not be mapped, so the dog handler should be able to give information regarding confusion factors on trails. An awareness of visual tracking is important.

With SAR resources feeding information to the base camp, a change in the search plan is likely to develop. Search dogs and handlers can be easily and quickly transported to the new area with a minimum of backup support.

Use of Dogs in Disaster, Avalanche, and Water:

In addition to use in wilderness, searching dogs are being used extensively to find victims that are out-of-sight, covered by debris, snow, or water. They were used to find subjects in debris from earthquakes such as recently in Mexico City and San Francisco. By the strength of the dog’s alert, the handler can often tell if the subject is alive or dead. That way rescue efforts can be concentrated in the areas where people are still alive.

Dogs have found subjects under avalanches, including three alive in the United States in the last decade. They are also used to find subjects who have been covered by fallen snow.
The newest use of dogs has been to find drowning victims in rivers and lakes. While so far these searches have just been recoveries, they have saved time and effort for divers and have let the families find their loved ones.

The adaption of a searching dog to another environment (debris, snow, water, etc.) requires distinct methods and experience, but it is still an extension of basic search work.

Coverage

Tracking/Trailing Dogs

Since the trailing dog is not "covering" an area per se, the handler’s feedback is unique. Should the dog appear to "be on track" and then lose the direction, a decision must be made to evaluate the direction that the dog indicated, because by now other searchers are waiting for deployment, (possibly according to the indications of that dog). It can be very difficult to accurately assess a trailing dog’s work. The factors of length of time, weather, and conflicting odor are hard to evaluate, and an estimation of these should be obtained from the handler. The probability of direction indicated by a trailing dog who didn’t complete the assignment will generally be low. In addition, the search director can consider factors of terrain evaluation, victim behavior, or visual track clues.

Searching Dogs

Before explaining coverage in relation to searching dogs, further information about this resource is necessary. A single search dog is a very limited resource; therefore, the concepts presented in this paper are for multiple dog/handler teams (a SAR dog unit).

A searching dog can work an area after other searchers have been through it. After some length of time, usually about two hours, the level of scent left by other searchers would be at a low level compared to the airborne scent continuing to develop around the subject. It is necessary to record when the area was searched and what probability of detection was given the area. This information will aid in the decision of whether a repeated search by dogs or other resources is justified.

The searching dog is intended to search fast and efficiently. Because of this, hasty search techniques with dogs have produced a high yield proportionate to hours expended. On a large percentage of missions, by dispatching one dog and handler each to a number of possible routes or areas, high probability areas can be searched quickly with a high POD. While this technique may find the subject part of the time, its other value lies in information obtained from skilled handlers. Details on terrain barriers, escape routes, and other possible clues will provide a valuable basis for solidifying the search plan.

When an area is assigned to searching dogs, the dog operational leader will decide how to assign the dogs within that area. If possible, natural boundaries such as paths, drainages, or ridge-tops will be used to subdivide the terrain for each dog and handler. To search the assigned area the handler chooses an appropriate starting point then provides direction, encouragement and guidance to the dog who works off-lead ranging ahead and checking the scents in the area.

Preferably, each handler works independently, allowing them greater freedom and flexibility to adjust to wind direction and terrain features. Lacking any existing boundaries, handlers set up an arbitrary boundary between them and communicate via radio and meeting occasionally to confirm the coverage given to this "unnatural" boundary. Using dogs in a line search is seldom, if ever, beneficial, whether the spacing between dogs is close or widespread. This tactic hinders both the ranging of the dog and the speed and mobility of the dog/handler team.

Prior to working the problem, the handler establishes what percentage of coverage is desired. The main criteria is the length of time allotted to work the area. This could be a high POD in a smaller area, or a less thorough search (low POD) of a larger area. The handler should be trained to estimate his coverage after completing the area. Debriefing will ascertain whether the proposed POD was
accomplished. Debriefing may also bring out that sections of the overall area that may have been less thoroughly searched (or not at all). These “holes” in the coverage are critically important and must be considered in future planning.

The effectiveness of dogs as a SAR tool is directly related to the degree of training of the dog and the knowledge and skill of the SAR dog handler.

**Summary**

Search dogs have proved to be a highly successful resource available to the search planner. Following is a summary of the advantages and limitations of using the different types of dogs and why the unit concept of several dogs and handlers has proven to be so useful:

**Tracking/Trailing Dogs**

**Advantages:**
1. May be locally available.
2. Able to find the subject in the early stages of the search.
3. Can indicate a direction of travel. A helicopter can be used to search ahead of dog.
4. Can work at night.

**Limitations:**
1. Dogs must be utilized early in the search before the trail has dissipated, or be trampled out of existence.
2. Dogs cannot work a trail in extreme heat or heavy downpour.
3. Must correctly identify and preserve Point Last Seen (avoid scent left by searchers).
4. Must have unlaunched and carefully preserved scent article available.
5. Accurate assessment of a partially completed trail is very difficult.

**Searching (Air Scenting) Dogs**

**Advantages:**
1. Dog does not need a trail to follow as the dog searches for point source of scent.
2. Scent articles not mandatory, although dog handler should be advised if one is available.
3. Can work at night.
4. Hidden and buried subjects can be detected - evasive subject, disaster, avalanche, snow, volcano, water.
5. Searching dog can work area after other searchers have been through it.

**Limitations:**
1. Weather - extreme heat with no wind, or heavy downpour.
2. Extreme variations of terrain with scent voids and thermals.
3. Burial debris that is excessively deep or dense, limiting escape of scent.
4. Technical climbing areas.

**Unit of Several Dogs and Handlers:**

**Advantages**
1. Large coverage from a few dogs and handlers.
2. Transported easily.
3. Hasty team resource; handlers have other skills that provide ongoing information:
   a. Terrain evaluation.
   b. Visual track awareness.
   c. Victim behavior.
   d. Mapping.
4. Probability of Detection can be utilized both before and after searching an area.

A GUIDE TO THE USE OF AIRCRAFT IN SUPPORT OF LAND SAR OPERATIONS

GENERAL

WHAT AIRCRAFT CAN DO:

Although aircraft are exceptionally useful, they are not the ultimate answer to the Search Manager’s problems. If used properly, they can greatly enhance a ground search effort. Aircraft can get on-scene in minimum time for an initial search of the area, do a route search or evaluate any surrounding terrain. The Search Manager can also obtain an overview of the area, obtain search tactic information; have messages dropped, as well as supplies, pararescue aid and even communications relays if necessary. Both helicopters and fixed wing aircraft can do any of these functions. In addition, helicopters can move both men and supplies to definite search areas, pick up victims and sometimes search more effectively than fixed wing. Tracking can also be done from helicopters in some terrain with phenomenal success. While some fixed wing provide low, slow flight if equipped with Short Take Off and Landing modifications, they can never provide the same platform and capabilities as a helicopter.

WHAT AIRCRAFT CANNOT DO:

While aircraft should be considered in conducting any ground SAR activities, their use should definitely not be counted on for all situations. There are numerous occasions when weather, mechanical difficulties, fuel supply logistical problems and even pilot qualification difficulties can preclude use of aircraft resources. There should always be a back-up plan for operational activities without the use and dependency on aircraft.

1.0 MANAGEMENT

1.1 The SAR Plan

A. The authority and responsibility for conducting air search operations should be established and well known throughout Local SAR organizations.

B. Cooperative agreements should be collectively established between military, volunteers, federal agencies, state agencies and local law enforcement. (Who’s gonna do what?)
C. Just exactly how will communications take place between agencies? Will there be a liaison officer designated for each agency?

1. What are the air support request procedures and who will make them? If specific channels are required to request an aircraft, then an outline of those communication linkages must be written. If military aircraft are to be requested and used, then specific SOPs must be established for requesting that resource.

2. Develop a ground operations plan in case aircraft are not available due to weather or other primary conflicting tasks or even mechanical difficulty.

1.2 Aircraft Capabilities and Limitations

A. Many factors affect an aircraft’s capabilities and limitations. There are literally dozens of aircraft that might be suited to specific functions and environmental factors. Temperature, operational altitude, availability, high wing, low wing, payload capability and fuel consumption rate all have impact on the decision to use a particular airborne resource. By the same token, someone is eventually going to ask about cost factors . . . . Who is going to pay for the air time? How much is it going to cost and are there free resources available? (military?) If there are local military units, civilian organizations, individuals or specific organizations available, set up some kind of working relationship. How about training and who's going to sponsor it? A little bit of investigation and effort will answer all of these questions and more.

B. Even high time experienced pilots are not necessarily suited or qualified to fly search mission tasks. Search and rescue flying demands an exceptionally well trained and qualified pilot. In many parts of the country, SAR mission flying requires extensive mountain experience coupled with collective search operations training and pilot observer teamwork. There is no substitute for training and orientation of probable air resources that you might use in your area.

C. Trained and experienced spotter/observers for aircraft are invaluable for air operations. Sometimes the best personnel for this job are already thoroughly trained as ground SAR team members. They seem to have a better overall aptitude for performing this function during air support of ground operations. It is essential to stress that any spotter/observer must work very closely as a team with his/her assigned pilot. They each have a valuable function that cannot be separated.
1.3 Ground Crew

A. Air Operations Officer:

During a large search operation, it is silly to think that one person can handle all that would be necessary to keep track of air operations. In most cases however, since very few aircraft (usually just one or two) are involved, the function can be handled by one person. It is advisable to have a trained pilot in this position because of the need to know aircraft capabilities, limitations, weather factors, servicing needs and other important safety factors.

1. In cases where helicopters and sometimes fixed wing operations are being based out of non-staffed airfields, a trained technician must fill a ground crew position. He/she will maintain safety practices for SAR personnel as well as the public, provide information regularly to the Operations Chief, coordinate flights, patterns, flights, pilot needs and assignments, supervision of crews and loading and unloading of supplies.

2. Other ground crew support staff should have specialized training and experience as well. They should be familiar with the use of smoke markers, signalling, paracargo dropping procedures, one skid landing on rough terrain, helijumping as well as sling loading and ground crew safety rules.

1.4 Air Operations Base (airfield, air strip, heliport, helipad)

A. The air operations base should be located as close to the search area as possible and still be able to maintain needed support functions. It is desirable to be able to communicate with the staff at Search Base. This insures there will be few communication gaps in the overall operation. Consideration should be given to a location that would be able to provide maximum air support time on-scene. (minimum amount of time commuting to the search area) In addition, as the size of an operation grows, personnel needs such as feeding facilities, sleeping quarters, phone, radio and other "creature comforts" must be considered. Aircraft support and logistical supplies are also vitally important. If you can't get the right fuel, or any fuel, then obviously other arrangements will have to be made at another location.

1.5 Briefing the Pilots, Crews and Observers

A. Briefing checklist:

1. Operational objective or objectives should be discussed. Give a run down on the mission history up to this point, subject description, search area, pattern of proposed search and the track spacing that will be used.
2. Establish what the chain of command is for the entire operation.

3. Give the grid quad designation and make sure everyone has a map. If specific locations are necessary, make sure everyone knows the point location system you are using (latitude/longitude, uniform map system etc. . . .)

4. Communication call numbers, frequencies and compatibility with ground teams in the search area is also desirable. What units are on-scene and how do we contact them if necessary?

5. Safety rules or identification of any potential hazards in the area is a must.

6. Terrain conditions, weather over the search area, expected turbulence, wind conditions and refresher information on mountain flying rules if the search area is mountainous.

7. Check in and check out procedures both at the air ops base and the search base while flying.

8. Establish who will talk to the press and at what point. Usually specific agency policy will dictate this function.

9. Identify what the arrangements are for food, rest facilities, fuel and special gear or equipment that might be available.

2.0 AIR SEARCH PROCEDURES

2.1 FIXED WING: Fixed wing aircraft are generally most effective in relatively open terrain. (not necessarily flat, but open) Even at low, slow flight with everything out, they will still be traveling somewhere between 60 and 100 knots. For safety purposes, fixed wing aircraft should generally work from higher terrain to lower terrain. This means that the Search Manager and Operations Chief must understand the capabilities of the aircraft they are using, and what primary missions they can accomplish. Try not to use both fixed wing and helicopters in the same specific search area. If it is necessary, separate them with plenty of altitude.

2.2 HELICOPTERS: Helos can operate at lower altitudes, slower speeds and in tighter areas than fixed wing. They can often be used to get search personnel to summits quickly for energy and time savings, check out specific clues, transport supplies and crews to difficult areas and much more. While helicopters may seem to be the ideal search platform, they do have limitations and even under ideal conditions, will give only minimal probabilities of detection.
2.3 Assign each aircraft to its own area and try never to double up, or overlap areas. This frees pilots up to concentrate on altitude, speed and grid orientation.

2.4 Aircraft working in adjacent areas should have communications between them for safety. When possible, it is also very beneficial to have communication with ground teams and a location reference for air recon in that area.

2.5 The roughest terrain should be flown in the early morning hours to avoid excessive turbulence and allow maximum use of aircraft capabilities. If conditions permit and the possibilities of a live subject exist, night flights should be considered to look for lights, fires or even signalling devices.

2.6 There are no hard and fast rules concerning search patterns on a given mission. Every situation and area will dictate the most optimum use of the aircraft. Generally, each pilot will be assigned an area that will be determined by grid lines or natural features and the altitude, speed and pattern will be determined by the Operations Officer and the pilot.

A. Typical Search Patterns:

1. Contour -- Follows the elevation contours from higher to lower terrain.

   One slope or drainage to cover.

   Small mountain.

2. Route search - If you have a definite point of departure, and destination.
3. **Parallel of intended route search** -- Each side of the route is searched with overlapping passes.

4. **Expanding square** -- A starting point is established and an expanding square pattern is worked from there outward.

5. **Creeping line grid** -- A track spacing distance is established a grid is run completely across a given search area.

### 3.0 DEBRIEFING

3.1 Maintain a checklist and routine procedure for extracting information from returning pilots and crews. Find out specifically what they saw, an evaluation of how well they did, and in particular, designation of areas that were not eyeballed sufficiently. Try to solicit any suggestions from them about improving the search effort as well.

### 4.0 DOCUMENTATION

4.1 Make sure that all flight logs, plans and maps are saved for future reference. It will also be helpful if totals for man-hours, flight time, fuel used and other pertinent data is not only logged but tallied for future record and potential budget recommendations.
CALLOUT PROCEDURES

OBJECTIVES: A student will be able to--

* Describe the information that needs to be provided to the resources that are being called to provide assistance.

* Discuss the importance of providing this information.

* Preplan his/her own equipment.

1.0 INFORMATION TO PROVIDE TO RESOURCES WHEN YOU CALL:

1.1 When requesting assistance from outside resources, you must provide them with certain information. Information may vary with the specialty of each resource, but generally will include:

a. Mission number (if applicable)
b. When do you want them - time, day, etc.
c. Description of the situation (who, what, when, where, how).
d. Special skills needed from them.
e. Who (what other units) is/are responding.
f. Number of persons (and/or teams) required. Request that they call you back and confirm numbers actually responding before they depart.
g. Current weather and forecast at the search area:
   ♦ Road conditions.
   ♦ Flying conditions. ♦

h. Terrain description.
i. Elevation range.
j. Personal equipment needed by searchers.
k. Group or specialized equipment needed.
l. Communications procedures; frequencies, etc.
m. Map quads being used.
n. Meeting place:
   ♦ Signs.
   ♦ Markers.
   ♦ Route suggested.

The combination of urgency factors will help determine not only how quickly to respond, but the level of response.
o. Who to report to upon arrival at the search area.
p. Callback number.
q. Exactly when they should report.
r. An indication of how long they might be needed.
s. Call off procedures (in case subject is found while they are en route):
   ♦ License numbers, vehicle descriptions.
   ♦ Check-in periodically while en route.
   ♦ Public radio.
   ♦ Their own communication system.

PROVIDING THE ALERTED RESOURCES WITH ORGANIZED AND OPERATIONALLY SIGNIFICANT INFORMATION AT THE TIME THEY ARE CALLED OUT WILL REDUCE DIFFICULTIES, UNPREPAREDNESS AND MISUNDERSTANDINGS THAT COULD DIMINISH EFFICIENCY.
SEARCH TACTICS: THE PROBABILITY OF DETECTION (POD)

OBJECTIVES: A student will be able to--

* Discuss the importance of quantifying the probability of detection.

* Describe Type I, Type II, and Type III searching (As discussed in the Applying SAR Resources Chapter).

* Demonstrate the ability to compute search POD's and the POD of multiple coverage.

\[ P_D \]

PROBABILITY OF DETECTION

DEFINITION:

What are the chances of spotting the subject or clues?

Probability of Detection is an Indicator of the Quality of Search Methods
1.0 PROBABILITY OF DETECTION CALCULATIONS

1.1 Probability of Detection (POD) = The Probability that the subject or clue will be detected by the search action if the subject or clue is in the search area.

1.2 The application of probability theory to ground searching was brought into the forefront in 1974 when an experimental analysis of grid searching was conducted by Jon Wartes, Washington State Explorer Search and Rescue. Probability theory now has been applied to all types of resources.

a. The "givens" in these experiments were:

- Trained (ESAR) grid searchers were used.
- Tests took place in moderate to dense underbrush (Pacific Northwest).

AN OVERVIEW OF TACTICS

EVENTS

PREPLANNING

CONFINEMENT/ATTRACTION

PLANNING

TYPE I DETECTION

TYPE II DETECTION

TYPE III DETECTION

SUSPENSION

OR

POST MISSION PLANNING

OR RESCUE/EVACUATION

RELATIVE TIME
b. **Other factors** in the experiment were:

- The search objects varied in size and represented responsive/immobile subjects, unresponsive/immobile subjects, and small clues.
- Each method was tested 20 times, including 8 at night.
- Three methods (spacings) were tested:
  
  1. Average 20 feet spacing.
  2. Average 60 feet spacing.
  3. Average 100 feet spacing.

c. **Some useful conclusions** attributable to these experiments are:

- Average trained grid team takes 3.5 hours to go one mile in the conditions defined (daytime).
- Average probabilities of detection:

  1. 20' spacing = 90% POD.
  2. 60' spacing = 70% POD.
  3. 100 spacing = 50% POD.

d. We can apply these conclusions to a useful standard-sized search area segment.

<table>
<thead>
<tr>
<th>SPACING</th>
<th>HOURS</th>
<th>SEARCHER</th>
<th>SEARCHER-HOURS</th>
<th>POD</th>
</tr>
</thead>
<tbody>
<tr>
<td>100'</td>
<td>3.5</td>
<td>53</td>
<td>185.5</td>
<td>50%</td>
</tr>
<tr>
<td>60'</td>
<td>3.5</td>
<td>88</td>
<td>308.0</td>
<td>70%</td>
</tr>
<tr>
<td>20'</td>
<td>3.5</td>
<td>264</td>
<td>924.0</td>
<td>90%</td>
</tr>
</tbody>
</table>

- Place mock object looking for infield, walk away, to determine searcher distance.

"An Effective SAR Manager Saves Lives"
e. In addition, a mathematical formula has evolved with which we can calculate the POD for any desired spacing:

\[
\text{POD\%} = 100 - (.5 \times \text{spacing})
\]

**Example:** For 40' spacing

\[
\text{POD\%} = 100 - (.5 \times 40)
\]

\[
= 100 - 20
\]

\[
= 80\%
\]

Remember, these POD calculations will be comparable only to the extent that the "givens" (see 1.2 a) are comparable. To the extent they are different, adjustments would have to be made. The best calculations are the ones you test in your area, using the resources available.

2.0 **EXPANDED DISCUSSION OF DETECTION PROBABILITIES:** From *An Experimental Analysis of Grid Sweep Searching*, 1974, by Jon Wartes (used with permission of the author).

2.1 The most important aspect of POD experiments has to do with the differences between **thoroughness and efficiency**:

**THOROUGHNESS:** The ratio of the items found to the number of items in the team's path.

\[
\text{Thoroughness} = \frac{A}{B}
\]

Where

\[
A = \text{Number of items found}
\]

\[
B = \text{Number of items in the team's path.}
\]

**NOTE:** This definition allows thoroughness to exceed 100%. If a team finds 9 out of 10 items from within its path plus another 2 items off to the side of its path, its thoroughness will be 11/10 or 110%.

**This definition was selected because:**

1. On real searches, a find would not be discarded just because it was found to the side of the search team.

2. To disregard items found to the side of the team would be to distort the actual performance of the team. Since search methods can only be changed or improved by modifying what happens at the team level, the most sensible measure aimed at the team level is the most desirable.
**EFFICIENCY:** The proportion of items found within a unit area per searcher-hour of effort.

\[
\text{Efficiency} = \frac{AD}{BC}
\]

Where \( A = \text{Number of items found.} \)
\( B = \text{Number of items in the team's path.} \)
\( C = \text{Number of searcher-hours of effort.} \)
\( D = \text{Size of area searched.} \)

This definition came out of the reasoning that results achieved by team \( (A) \) could only be meaningful if they were compared to potential results \( (B) \). Searcher-hours \( (C) \) is a good measure of effort expanded to produce results but searcher-hours can be meaningfully compared only if area size \( (D) \) is equated.

As to the interplay of the variables within the formula, it was subjectively agreed that Efficiency should behave as follows:

1. If method \( M \) covers twice the area as method \( N \) (everything else constant), it should be twice as efficient.
2. If method \( R \) produces the same results as method \( T \) in half the time, it is twice as efficient.
3. If the team finds a higher proportion of items within the same amount of the time (other variables constant), it should be more efficient.

The above definition was adopted because it reflects this behavior. Unlike thoroughness, an index of the efficiency of a grid method has little meaning by itself. A thoroughness of 75\% can be understood, but what does an efficiency of .090 mean? Efficiency ratings are useful only when two or more numbers are compared. If a 20 foot grid spacing produces an efficiency index of .043 and a 100 foot spacing yields an efficiency of .104, then the 100 foot spacing can be said to be more efficient. Efficiency by itself has no meaning, it is useful only when comparing two or more methods to each other.

The most significant result of these experiments is the relative efficiencies of the tested methods. Briefly,

- **Daytime efficiency:** The 60' and 100' grid types were both significantly more efficient than the 20'. The difference between the 60' and 100' was insignificant.
- **Night-time efficiency:** Efficiency increased with wider spacing, but the differences among the three spacings were insignificant.
3.0 COMPUTING MULTIPLE COVERAGE

3.1 Rarely should an area be searched only once. Usually it is searched several times using different patterns or different resources.

3.2 A mathematical formula exists to compute the cumulative POD for multiple coverage:

\[ \text{Cumulative POD\%} = 1 - (a \times b \times c) \times 100; \text{ where,} \]

1 - (POD\% of 1st search) = a
1 - (POD\% of 2nd search) = b
1 - (POD\% of 3rd search) = c
Etc.

Example: - An area is searched first with a helicopter (POD = 20%); then with dogs (POD = 50%); then with a grid team (POD = 25%)

\[ a = (1 - .20) = .80 \]
\[ b = (1 - .50) = .50 \]
\[ c = (1 - .25) = .75 \]

\[ \text{Cumulative POD\%} = 1 - (a \times b \times c) \times 100 \]
\[ = 1 - (.8 \times .5 \times .75) \times 100 \]
\[ = 1 - (.3) \times 100 \]
\[ = 70\% \]

4.0 METHODS OF ESTABLISHING POD

4.1 Research

4.2 Training

4.3 History
5.0 IMPLICATIONS OF POD CALCULATIONS FOR SEARCH MANAGEMENT:

5.1 Probability of Detection calculations can become important to the Search Manager because there are a number of factors involved that are variable. In some cases these factors can be manipulated by the Search Manager to create the most advantageous outcome from the combination of variables.

a. The variables:

✓ Time available or allowed to accomplish.
✓ POD desired or accepted.
✓ Number of hours searchers are available.
✓ Size of the segment to be searched.
✓ Type (effectiveness) of resources to be used.
✓ Search method or combination of methods.

5.2 While the Probability of Success (POS) value can be used by the Search Manager to predict outcomes of alternative proposed search actions, its value as an after-the-fact indication of success is useless (either the subject was found or was not found). On the other hand, the value of the cumulative POD (POD$_{cum}$) to represent how effective a search effort has been is very important. A Search Manager can use the POD$_{cum}$ to:

✓ Decide whether to re-search a segment.
✓ Decide whether to expand the total search area.
✓ Decide whether to use additional or different resources.
✓ Defend search actions to higher authorities, the media, relatives or in court.

\[
\text{PROBABILITY OF SUCCESS} \quad \text{POD}_A \times \text{POD}_B = \text{POD}_{cum} = P_s
\]
Mathematically, POD calculations can range between 0 and 100% for POD's and spacing can range between near 0 to infinity. The curvilinear graph above reflects the reality that the extremes, while approached, may never be reached. **Search managers must recognize that there is an optimum spacing (that varies depending on terrain, sight distance, searcher conscientiousness, etc.) beyond which the returns diminish.**
6.0 COMMUNICATION APPLICATIONS

The following problems are typically faced by a Search Manager and show how the earlier described variables (5.1) come into interplay. (unless otherwise instructed, use standard figures from 1.2).

Problem 1

Given: You have 25 grid searchers available for 7 hours.
Question: How large an area can be searched with a POD of 70%?

Problem 2

Given: Based on past experience, your local Rescue Dog Association handler estimates she can search 1 square mile of terrain in your search area in 4 hours (1 handler and 1 dog) with a POD of 80%.
Question: How many searcher hours of grid searching would it take to search this same area with a POD of 80%?

Problem 3

Given: Billy Joe Smith, age 7, wandered away from his family on a country road this morning. This was reported to you at noon. Sunset is 2115 (with 30 more minutes of usable light). You have decided to shoot for an 80% POD.

Assume you go ahead and search the area (established at 3 square miles) with dogs. They report an 80% POD, but no finds. You decide then to re-search the area with an open grid 100' spacing.

Question: What is the cumulative POD?

(But you're still not successful!)

Given: The local rescue squad (50 miles away) can provide 100 persons for 10-1/2 hours of searching tomorrow, but they are reluctant to leave their jobs unless it is absolutely necessary.

Question: What would be the increase in the cumulative POD by using these searchers?

Question: Is it justifiable?
Problem 4  (An example of the efficiency of cumulative coverage)

**Given:** (Method #1) A search segment of 1 square mile and enough searchers to search it with one sweep with 40’ spacing.

**Question:** What is the POD?

**Given:** (Method #2) Say you decide to split the segment in half and using the same number of searchers (half in each 1/2 square mile segment) search each segment with 80’ spacing with two sweeps.

**Question:** Is there any difference in the total elapsed time between this and method #1?

**Question:** What is the cumulative POD for the entire one square mile segment using method #2?

---

**Problem**

- 10 year old subject wanders away from campground at 4:00 PM. Weather good, no hazards. You send out two hasty teams, and in addition, by 10:00 PM, you believe you have the search area confined (5 mi²) and that subject is still in that area.
- 100 untrained local rescue personnel will be available at 6:00 A.M. tomorrow.
- Using figures from previous problems, discuss implications of alternatives available to you.
- What if weather is rapidly deteriorating and hypothermia is possible?

---

**The Wartes Theorum**

Repeated sweeps of the same area with wide spacing will be more efficient than a single sweep with close spacing.
DECREMENTAL EFFECTS IN SEARCH MISSIONS

(Adapted from concepts originated by Dr. John M. Bownds)

Search Managers must be aware that there are numerous factors that creep into, and can make inaccurate, the calculations involving POD. Theoretically, the results and decisions can be drastically affected. An example of a decremental effect follows:

The cumulative POD concepts already described assume that each search of a segment is completely independent from each preceding search. However, the fact that a segment has already been searched influences the next search (by the same resource or a different one) to search that segment. Therefore, the individual searches are not independent, and the cumulative POD equation is not entirely valid.

Because of "prejudice" (e.g. "the bugger can't be here because we already searched this segment... ") the POD of subsequent searches of the same segment might more accurately be expressed by \( d \times POD \), where \( d \) is some decrement factor (perhaps measurable?) with \( 0 \leq d \leq 1 \). Then, the cumulative POD (for two searches) is not:

\[
POD\% = 1 - (a \times b) \times 100, \]

but rather:

\[
POD\% = 1 - [a \times (d \times b)] \times 100.
\]

If \( d \) is rather small (i.e. large decremental factor) then the effect can be quite important. What's more, even if \( d \) is not so small, the decremental effect may accumulate (e.g. the 3rd search may have a POD of \( d \times [d \times POD] = d^2 POD \)). The consequence is that the Search Manager is not achieving the \( POD_{cum} \) that s/he assumes.

Other decremental effects could result from factors such as:

- Searcher fatigue.
- Searcher boredom.
- Weather influences on sight and searcher comfort.
- Terrain and vegetation.
- Prejudice (subjective here)

The important point here is that the Search Manager must be aware that the POD is influenced by numerous factors. S/he must consider the decremental effects on POD, or be conservative in validating POD's reported by search resources. It is better to err on the conservative side of POD values than to use ones that might be inflated.
7.0 **SEARCHER FATIGUE**

Numerous studies have been conducted by the Coast Guard and Air Force concerning fatigue impact on search effectiveness (POD). Unfortunately, data on fatigue and the effectiveness of ground searchers is lacking, but we can look at maritime and air SAR fatigue studies for some hints.

During controlled studies "visual vigilance" was the medical parameter used to determine the effects of fatigue on the observers (searchers). "Visual vigilance" involves not only the alertness of the eye but the transmission of information from the eye to the brain (the alertness for reporting or action-taking).

**Results:** Searchers are most effective during the first four hours. Maximum efficiency occurs within the first hour. The efficiency curve begins a sharp decline after four hours and reaches bottom by eight hours. Searchers must be given adequate rest after each shift. The longer they are on the job, the longer the subsequent rest period should be.

**Implications to ground search:** Only deploy teams to field for maximum of four hours. Ensure adequate rest after they return.

8.0 **SUMMARY**

**OLD PERSONS' TALES**

- **An area should be searched only once. It's wasteful to search it a second time.**
- **You should search such that "you can be sure the lost person is not in the area." The emphasis is upon thoroughness (close spacing).**
- **It is better to get large numbers of grid searchers into the area quickly.**

---

YOU ARE WORKING FOR THE LOST SUBJECT
TECHNIQUES INFORMATION

1. Rotate teams from area to area rather than have same team re-search same area.
2. Mark search areas well.
3. Don’t worry about staggering spacing between first and second search.
4. On 2nd, subsequent searches, start from different angle if practical.
5. Use 3-man team concept for very wide spacing.
6. Teach concepts to team members; leaders. Or, they will be uncomfortable with this strategy.

REPEATED SWEEPS OF THE SAME AREA WITH WIDE SPACING WILL YIELD BETTER RESULTS THAN A SINGLE SWEEP WITH CLOSE SPACING.

• There is a tendency for team members to feel uncomfortable with wide spacing. They want to do a good job, but they also know they aren’t being thorough.

• Two ways to reduce this conflict:
  1. Educate team members about the concepts of non-thorough searching methods.
  2. The responsibility for missing the subject is the search director’s, NOT the team members.

This method of searching is a good gamble; it will pay off more times than not.
WHEN NON-THOROUGH METHODS SHOULD BE USED

1. Whenever there is a large search area in relation to the manpower available.
2. Whenever time is a factor.
3. Evidence searches where numerous objects are being sought.
4. When substantial manpower is expected, but hasn’t arrived yet.

EFFECT OF MULTIPLE SWEEPS

<table>
<thead>
<tr>
<th>SPACING</th>
<th>SWEEP 1</th>
<th>SWEEP 2</th>
<th>SWEEP 3</th>
<th>SWEEP 4</th>
<th>SWEEP 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>100'</td>
<td>50%</td>
<td>75%</td>
<td>97.5%</td>
<td>99.75%</td>
<td>99.875%</td>
</tr>
<tr>
<td>60'</td>
<td>70%</td>
<td>91%</td>
<td>97.3%</td>
<td>99.2%</td>
<td>99.8%</td>
</tr>
<tr>
<td>20'</td>
<td>90%</td>
<td>99%</td>
<td>99.9%</td>
<td>99.99%</td>
<td>99.999%</td>
</tr>
</tbody>
</table>

WHEN THOROUGH METHODS SHOULD BE USED

1. If there is abundant manpower
2. Where circumstances make wide spacing impractical
   A. Dangerous terrain
   B. Some kinds of heterogeneous terrain
   C. Logistical difficulties
   D. Search Director mandates it
### Grid Searchers

To search one square mile:

<table>
<thead>
<tr>
<th>Pd (%)</th>
<th>Spacing (feet)</th>
<th>Searchers</th>
<th>Hours*</th>
<th>Total Searcher Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>190</td>
<td>27.8</td>
<td>3.5</td>
<td>97.2</td>
</tr>
<tr>
<td>10</td>
<td>180</td>
<td>29.3</td>
<td>3.5</td>
<td>102.7</td>
</tr>
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<td>15</td>
<td>170</td>
<td>30.1</td>
<td>3.5</td>
<td>108.7</td>
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<td>20</td>
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<td>25</td>
<td>150</td>
<td>35.2</td>
<td>3.5</td>
<td>123.2</td>
</tr>
<tr>
<td>30</td>
<td>140</td>
<td>37.7</td>
<td>3.5</td>
<td>132</td>
</tr>
<tr>
<td>35</td>
<td>130</td>
<td>40.6</td>
<td>3.5</td>
<td>142.2</td>
</tr>
<tr>
<td>40</td>
<td>120</td>
<td>44</td>
<td>3.5</td>
<td>154</td>
</tr>
<tr>
<td>45</td>
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<tr>
<td>50</td>
<td>100</td>
<td>53</td>
<td>3.5</td>
<td>185.5</td>
</tr>
<tr>
<td>55</td>
<td>90</td>
<td>58.7</td>
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<td>88</td>
<td>3.5</td>
<td>308</td>
</tr>
<tr>
<td>75</td>
<td>50</td>
<td>105.6</td>
<td>3.5</td>
<td>369.6</td>
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<td>80</td>
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<td>132</td>
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<td>462</td>
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<td>3.5</td>
<td>616</td>
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<tr>
<td>90</td>
<td>20</td>
<td>264</td>
<td>3.5</td>
<td>924</td>
</tr>
<tr>
<td>95</td>
<td>10</td>
<td>528</td>
<td>3.5</td>
<td>1848</td>
</tr>
</tbody>
</table>

*Average trained grid team takes 3.5 hours to go 1 mile.

### CUMULATIVE PROBABILITY OF DETECTION (POD) CHART

<table>
<thead>
<tr>
<th>Previous Cumulative (POD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-10%</td>
</tr>
<tr>
<td>11-20%</td>
</tr>
<tr>
<td>21-30%</td>
</tr>
<tr>
<td>31-40%</td>
</tr>
<tr>
<td>41-50%</td>
</tr>
<tr>
<td>51-60%</td>
</tr>
<tr>
<td>61-70%</td>
</tr>
<tr>
<td>71-80%</td>
</tr>
<tr>
<td>80+</td>
</tr>
</tbody>
</table>

1. Find the previous cumulative POD on the left
2. Find the POD for this search on the bottom
3. Locate the box where the row and column meet

Example: 1. Previous cumulative POD = 45%
          2. POD this search = 15%
          3. New cumulative POD = 55%
Enter the table with the previous cumulative POD on the left and the POD for this search at the top.

Read the new cumulative POD at the row and column intersection.
PROBLEMS

Compute the cumulative POD for the following sweeps.

1. 30% POD Helicopter Grid
   70% POD Grid sweep 60' spacing
   50% POD Grid sweep 100' spacing
   Cumulative POD_______

2. 90% POD Grid sweep 20' spacing
   40% POD Dog team sweep through area
   30% POD Hasty Team
   Cumulative POD_______

3. 30% POD Hasty Team
   30% POD Helicopter Grid
   30% POD Dog team sweep
   Cumulative POD_______

4. 70% POD Grid sweep 60' spacing
   70% POD Grid sweep 60' spacing
   70% POD Grid sweep 60' spacing
   Cumulative POD_______

5. 90% POD Grid sweep 20' spacing
   70% POD Grid sweep 60' spacing
   50% POD Grid sweep 100' spacing
   Cumulative POD_______

6. 90% POD Grid sweep 20' spacing
   20% POD Hasty Team
   30% POD Tracking dog team
   Cumulative POD_______

7. 90% POD Grid sweep 20' spacing
   90% POD Grid sweep 20' spacing
   90% POD Grid sweep 20' spacing
   Cumulative POD_______

8. 50% POD Grid sweep 100' spacing
   50% POD Grid sweep 100' spacing
   50% POD Grid sweep 100' spacing
   Cumulative POD_______

9. If 105 searchers are available for 9 hours, how large an area can be
   covered with a 70% POD?

10. If the search area is 2 square miles, and you want a 70% POD, how many
    searchers would you need to search it in one (1) day. (Assume 10 hours
    equals 1 day).

11. A search area of 5 square miles would take _______searchers to
    cover it with a 70% POD. (Assume 10 hours equals 1 day.)

12. 58 searchers can cover _____square miles in 7 hours with a 50% POD.
REVIEW AND SUMMARY OF POA X POD = POS

OBJECTIVES: A Student will be able to--

* Understand, that as an effective Search Manager, it is very important to have the ability to measure the on-going search effort.

* Know what kinds and types of values that the Search Manager must assign to the search mission.

* Remember and include the crucial of search theory in all phases of search planning.

"We have never lost a game, but once in a while, time ran out on us."

- Vince Lombardi

VALUES THAT MUST BE ASSIGNED

1. A value that gives a priority to the mission urgency
2. A value that gives priorities to search areas (PA)
3. Values to ability of resources to detect subject (PD)
4. A value that is the product of \( P_A \times P_D \) to measure success (PS)
1.0 REVIEW AND SUMMARY OF POA X POD = POS

1.1 So, what are all of these numbers and concepts? (Yes, we know, a real P.I.T.A.) Remember, the purpose is to find someone alive, and to make effective, efficient use of all time and effort that is expended.

1.2 The three (3) main ingredients for successful search planning are:

1. The probability that the subject is in the search area (POA).
2. The probability that the resources deployed can spot the subject (POD).
3. The probability of being successful (POS).

1.3 In addition to having the ability to assign these values, a successful Search Manager must be able to:

   a. Assign a value that gives a priority to the mission urgency. The priority assigned will govern the level (quantity) and urgency of response by SAR resources.

1.4 Remember, as an effective Search Manager, it is very important for you to have the ability to measure your search effort - on-going. POA X POD = POS will help you:

   a. Know how effective you have been.
   b. Re-distribute resources.
   c. To decide which segments of the area need to be re-searched.
   d. To increase search area size.
   e. Justify when to suspend an unsuccessful search.
   f. Rationalize actions to higher authority; relatives, media.

1.5 So, in final conclusion and review - values that must be assigned by the Search Manager are:

1. A value that gives a priority to the mission urgency.
2. A value that gives priorities to search areas.
3. Values to the ability of resources to effectively detect the subject.
4. A value that is the product of POA X POD that will measure success.

2.0 REMEMBER, A SUCCESSFUL SEARCH IS ROOTED IN STRONG FUNDAMENTALS

2.1 Success components include:

   a. Theory of Search.
   b. Organization.
   c. Planning (Strategy).
   d. Tactics - Search Techniques.

2.2 Search Theory implementation is the redundancy that assures success when short cuts fail! And as a successful Search Manager, you must always remember and include the crucial of search theory in your thinking and planning strategy.
The Crucials of Search:

1. Search is an emergency.
2. Search is a classic mystery.
3. Search for clues, not the subject.
4. Concentrate on aspects that are:
   - Important to search success.
   - Under control of the Search Manager.
5. Know if the subject leaves the search area.
6. Grid search is the last resort.

3.0 **NOW THAT YOU HAVE THE AWARENESS AND KNOWLEDGE - you, as a successful search manager can make a difference.**

3.1 How?

a. Organize.
b. Manage.
c. Use qualified, trained resources.
d. Use an overhead team.
e. Keep current on new information and trends.

- especially within strategy and tactics.
- there's lots of new things constantly developing.

And, the ultimate goal is to eliminate SAR problems through PSAR,

- so educate and be involved.

3.2 **Barriers to Progress** continue to be:

a. Traditions.
b. Inaccurate data.
c. False economy.
d. Poor training.
e. Afraid to take risks.

So - Remember -

**Efficiency is doing things right!**

and

**Effectiveness is doing the right things right!**
WE HAVE INTRODUCED THE THREE MAIN INGREDIENTS FOR SEARCH PLANNING:

1. The probability that the subject is in the search area \( P_A \)
2. The probability that the team can spot the subject \( P_D \)
3. The probability of being successful \( P_S \)

\[ P_S = P_A \times P_D \]

"NOW." said the rabbit. "THIS IS A SEARCH AND I'VE ORGANIZED IT..."

"DONE WHAT TO IT?" said Pooh.

"ORGANIZED IT. Which means...well it's what you do to a search, when you don't all look in the same place at once...."  

A.A. MILNE, 1928
BRIEFING

OBJECTIVES: A student will be able to--

* Discuss the important elements and procedures of briefing.
* Present a proper briefing.

"The purpose of a briefing is to summarize the situation past and present, and to provide any information that will help orient new personnel to all environmental and strategic facets of the problem."

- Tim J. Setnicka, Wilderness Search and Rescue, 1980

1.0 THE IMPORTANCE OF BRIEFING

1.1 Briefing is one of the most important activities on a search. A poor briefing can result in, among other things, poor search implementation, unsearched segments, misuse or destruction of clues, and ultimately, the failure to find the subject.

**Briefing Provides:**

- Situation status
- Objectives
- Strategy
- Tactical assignments

*Briefing (or the lack of) can make or break an operation. Everyone must be briefed!*

1.2 Briefings may be oral, written or a combination of the two.

- Written briefing statements and task assignments reduce confusion and improve communication.

2.0 WHO COORDINATES THE BRIEFING?

2.1 Briefing is coordinated by the Plans Chief or delegated to someone in the Plans Section on a large search operation.
3.0 **WHO BRIEFS AND WHO GETS BRIEFED?**

All involved personnel must be briefed.

3.1 **Planning Chief:**

a. Briefs overhead team.
b. Briefs team leaders, agency liaison personnel in smaller operations.

3.2 **Operations Chief:**

a. Briefs supervisors/group leaders in larger operations.
b. Briefs team leaders in medium size operations.

3.3 **Team leaders** brief team members.

3.4 Controlling factors are size of operation, number of personnel, location of resources requiring briefing.

---

The degree of one's emotion varies inversely with one's knowledge of the facts . . . .

THE LESS YOU KNOW, THE HOTTER YOU GET!

- Bertrand Russel

---

4.0 **WHERE SHOULD BRIEFINGS TAKE PLACE?**

4.1 Conduct briefings at a designated area, with plenty of room, that is sheltered, quiet, and free from interruptions.

5.0 **WHEN SHOULD BRIEFING TAKE PLACE?**

5.1 **For team leaders**, briefings should be conducted just prior to the team leaving for their search area.

5.2 **For others**, briefings could be conducted after teams move out to the search area and there is a lull in the activity, or when the overhead teams change shifts.

(See "The Planning Clock" in the "Search Management: Operations Planning" Chapter)
6.0 **WHAT INFORMATION NEEDS TO BE PRESENTED?**

The Search Action Plan, if properly prepared, serves as a ready-made briefing statement (see example in the Search Management: Operations Planning Chapter).

6.1 **To team leaders**, the following information should be conveyed:

a. **Situation status, objectives, strategies and predictions.**

b. **Subject information** - All information about the subject that will help the searcher recognize the subject, find clues, or determine the subject's behavior, such as:
   - Complete physical description.
   - Clothing and equipment (clothing carried, worn, clothing underneath).
   - Physical condition.
   - Mental condition.
   - Behavioral traits.
   - Circumstances causing the search.

c. **Vital Concerns - Medical/Health Problems?** - Medicine the subject may be in need of, etc.

   "Any simple idea will too often be presented in the most complicated way."

   d. **Clue Considerations:**
      - Sole pattern of footwear.
      - Items carried by subject that could be dropped or left behind.
      - How to report clues.
      - Instructions on logging clue locations and times found.
      - How to protect clue locations for followup.

   e. **Subject's trip plans.**

   f. **Terrain, hazards, etc.** in assigned search area.

   g. **Current (and predicted) weather** in assigned area.
h. **Equipment** needed by searchers:

- Clothing.
- Safety equipment.
- Food and water.
- Recording equipment.
- Specialized equipment.
- Other.

"The problem with Communication is the illusion that it has been achieved."

i. **Communication details** - designators, use of codes, frequencies, etc.

j. **Reporting details**: When to report in and where.

k. **Transportation details**.

l. **How long** will the teams be out.

m. **Who the relatives or close associates are** and where they are located.

n. **Media procedures** - where the media are located, who the media liaison is, instructions if searchers are contacted by media, etc.

o. **Tactical assignments** with explicit searching instructions for team:

- Specific area, where to start, and how to get there.
- Configurations, spacing, etc.
- Expected POD.
- Marking procedures.
- Adjacent teams, etc.
- Have other teams searched the area? (implications for tracking)
- When to start, when to stop.
- What to do if subject is found - alive, injured, dead; instructions on protecting the scene.

- **Emphasize medical plan, Rescue/Evacuation Plan.**

**These instructions are CRUCIAL.** You must tell the leaders exactly what you want done, where and how. Failure to do this will compound itself in terms of deficiencies and gaps in the search plan implementation.
p. Mission organization chart (who is in charge of what).

q. Debriefing instructions - where it will be and when, who to report to, what information will be needed and in what format.

r. Safety instructions - helicopter, terrain hazards, snakes, coyote traps, other hazards for dogs, etc.

s. If possible, estimate of when team can go home.

t. Procedures if team member is injured.

6.2 To other key individuals in the overhead team, briefings would convey specific information needed by each to perform his or her functions.

**7.0 BRIEFINGS SHOULD BE TIME-LIMITED TO:**

7.1 Maintain or improve morale of personnel.

7.2 Maintain management credibility in the eyes of subordinates.

7.3 Ensure timely response to field and maximum time for task accomplishments.

Briefings normally should take no longer than one-half hour.

**8.0 A KEY BRIEFING TECHNIQUE**

8.1 In every case possible, distribute written briefing statements, task statements diagrams, maps, photos, sketches, etc. to convey information. Examples are:

- Photo of subject.
- Briefing statement photocopied.
- Sketch of sole pattern.
- Map reproduced showing assigned area and searching details.

8.2 This requires adequate maps, materials and photocopying capability, at the search base, sometimes involving difficult logistics. But having reliable information for search personnel to constantly refer to will drastically reduce mistakes and omissions.

Remember, written briefings will:

- reduce confusion and questions.
- improves communication.
NOTES:

CUMULATIVE
CONFUSION

NEEDS
DOCTOR

GOTCHA!
10-7!
SEND OUT THE
10-11 QUICK
OUT!

HM...
I WONDER
WHAT JOE
NEEDS A
DOG FOR?

Q.K.,
JOE

YAKETY-YAK
10-7

10-4, WILL RELAY!
DEBRIEFING

OBJECTIVES: A student will be able to--

* Discuss the important elements of and procedures for debriefing.
* Conduct an effective debriefing.

"Debriefing is a complete interview and interrogation of a field search unit in order to gain a thorough understanding of all evidence and activities encountered during the day."

- Tim J. Setnicka, Wilderness Search and Rescue, 1980

1.0 THE PURPOSES OF DEBRIEFING:

1.1 To gather, through a complete interview and interrogation of resources, all of the information necessary for developing a complete, accurate understanding of that resource's prior field activities and for planning future search strategy and tactics.

1.2 Without thorough information, the subsequent planning may be unrealistic, misdirected, inadequate or incomplete.

2.0 WHO COORDINATES THE DEBRIEFING?

2.1 Debriefing is normally coordinated by someone in the Plans Section.

3.0 WHO SHOULD BE DEBRIEFED?

3.1 All personnel must be debriefed.

1. Overhead personnel debrief at the oncoming shift briefing.

2. Field personnel can be debriefed in several ways:

   a. In small incidents, debrief all personnel as they return to search base.
   b. In larger operations, debrief only team leaders who have previously debriefed their team members.
   c. In large, complex operations, division supervisors/branch directors may debrief with plans after debriefing their personnel.

3.2 Debriefing of searchers should be done individually, not in a group, if possible to reduce "joint opinion", and to focus on "individual belief".

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4.0 **WHEN SHOULD DEBRIEFING TAKE PLACE?**

4.1 Debriefings should be conducted as soon after the teams come out of the field as possible, while the information is still fresh in their minds and before they have much chance to talk with other search teams, which may tarnish their information.

5.0 **WHAT INFORMATION NEEDS TO BE OBTAINED?**

5.1 As a minimum, the following specific information should be obtained from the search teams:

a. **Explicit coverage** that the team ACTUALLY carried out.

b. Estimate of the **probability of detection** for the effort.

c. The **location of any clues** located, regardless of how insignificant they may seem.

d. **Search difficulties** or gaps in coverage encountered.

e. **Hazards** in the area.

f. **Problems** encountered **with communications**.

g. **Suggestions, ideas, recommendations** for future searching efforts.

### Debriefing:

- A tool for evaluating success.
- A foundation for future plans.

### Effective debriefing:

- Leaves no stone unturned.
- Is timely.
- Focuses on individual belief.
- Is written.
- Includes recommendations.

5.2 The crucial need is to get, as **EXACT** as possible, the area covered, spacing, gaps and how effectively (POD) it was searched. The use of sketches, diagrams and maps in plotting this information is essential.

5.3 Team leaders are sometimes reluctant to give a quantitative estimate of POD. One technique that can be used to "pull" the information out of them is to ask: "If there were ten subjects (or clues) in the area, how many of them do you think your unit would have located?" A response of "six" could correlate to a POD of 60%.
SEARCH EFFECTIVENESS FACTORS

The following provides a standard procedure for estimating aircrew search effectiveness. The debriefing officer will apply a value to each factor listed, as in the example. The sum of the values equals estimated effectiveness. The optimum value is 10, decreasing to 0 for no value.

1. Ability to maintain optimum altitude and airspeed. 8
2. Favorable visibility and weather conditions. 6
3. Nature of terrain and sea conditions. 5
4. Optimum track spacing and track spacing flown. 9
5. Qualification and availability of scanners. 9
6. Accuracy of navigation (consider aids used and available). 8
7. Enough time in search area to allow thorough search. 9
8. Attitude and physical condition of search crew after flight. 6
9. Adequate crew rest before flight. 10
10. Quality of lunches, coffee, water, etc. 6

TOTAL 76(%)

Though this method is specific to air crews and air search, a similar procedure can be created for land search. See the section on Decremental Effects in Search Missions in the POD Chapter.

"Information always deteriorates upward through bureaucracy"

- Wade, Trinidad 1981

6.0 DEBRIEFING SHOULD ALSO BE DONE IN WRITING

6.1 Written information reduces misinformation, misinterpretation, confusion.

6.2 Written information documents activities, becoming part of the incident record.

6.3 Best if a standard set of open ended questions are developed, and used for each team/individual (pass out with briefing packet).

6.4 Consider using individual maps if appropriate.
AN EXAMPLE DEBRIEFING REPORT

UNIT: ____________________  DATE: ________________  TIME: ____

LEADER: ________________  MEMBER: ________________

MEMBER: ________________  MEMBER: ________________

MEMBER: ________________  MEMBER: ________________

MEMBER: ________________  MEMBER: ________________

MEMBER: ________________  MEMBER: ________________

TIME SHIFT
BEGAN: ____________________  ENDED: ____________________

SEGMENT
SEARCHED:

DESCRIBE EXTENT TO WHICH OBJECTIVES WERE NOT MET: ____________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

POD
REPORTED: ________________

FACTORS AFFECTING POD (FATIGUE, WEATHER, SUBSEQUENT SEARCH
OF SAME SEGMENT, ETC.):

________________________________________________________________________

________________________________________________________________________

ADJUSTED
POD: ____________________

CLUES, SIGN, ALERTS (SPECIFY LOCATIONS & TIMES):

________________________________________________________________________

________________________________________________________________________

AREAS OF DIFFICULTY, HAZARDS, VOIDS, OTHER INTELLIGENCE:

________________________________________________________________________
CONDITION OF TEAM MEMBERS, INJURIES, PROBLEMS WITH EQUIPMENT, ETC:


WHAT DO THE TEAM LEADER/MEMBERS THINK HAPPENED TO THE SUBJECT? IDEAS ON WHERE SUBJECT IS:


IDEAS, SUGGESTIONS, RECOMMENDATIONS: ________________


ATTACH THIS REPORT WITH: TEAM ASSIGNMENT SHEET; SEGMENT MAP WITH COVERAGE; CLUES; ETC.


AS THE MANAGER -

- YOUR PRIMARY JOB
  * IS TO GUIDE THE AFFAIRS OF OTHER PEOPLE

- YOUR PRODUCT
  * IS THE RELEASED ENERGY OF OTHER PEOPLE

- YOUR PERFORMANCE
  * IS MEASURED BY THE ACCOMPLISHMENTS OF OTHER PEOPLE
DOCUMENTATION

OBJECTIVES: A student will be able to--

* Discuss the reasons for documenting the entire search effort.
* Describe the method of documentation for a search mission.

"Accurate documentation of all aspects of a search effort in a retrievable form is essential and may prove a godsend if legal complications arise . . . . the SAR Office can never collect too much information about an operation . . . . it is almost impossible to generate accurate records after the fact."

- Tim J. Setnicka, Wilderness Search and Rescue, 1980

1.0 WHY DO YOU NEED TO DOCUMENT THE ENTIRE SEARCH EFFORT.

1.1 Assists with the on-going planning effort.

   a. Allows for personnel shift changes without a loss of continuity.
   b. Documentation makes it possible to disseminate accurate information to searchers.

1.2 Enables you to reconstruct the entire search effort at a later time.

   a. For critique purposes.
      - What was right, OK, or wrong, and why.
   b. To aid improvements.
      - Aspects that need work to update the preplan and increase effectiveness on future missions.

Always keep a record - it indicates you've been working

1.3 Protects you from lawsuits.

   a. Court cases involving major searches are becoming more frequent.
      - Documenting the search effort may help provide evidence in court.

1.4 Aids you in gathering data on subject behavior.

   a. One of the most important methods of establishing probable search area.
b. Gathering subject behavior data through documentation will aid your next search.

2.0 WHAT SHOULD YOU DOCUMENT?

2.1 Documentation begins with the initial reports and ends with the revision of the preplan and follow-up on problems identified.

**Documentation is a continual ongoing process.**

2.2 Keep a chronological log of all significant events, decisions, communications, etc.

a. Should be kept current by dispatchers and the maps/records persons.
b. Consider using specialized information units or assigning several people just to keep records.

2.3 Other information that is documented:

a. Team briefing and debriefing reports.
b. Maps.
c. Weather progress.
d. Details about clues.
e. All major strategy and tactics planning sessions.
f. Any injuries incurred by searchers.
g. Expenses.
h. Any lost or damaged equipment.
i. Rosters of personnel involved.

2.4 Mission Suspension:

a. If the subject is found and is alive, interview that person and keep a record of it. (videotape, written)
b. If subject is not found, document the rationale and process used to suspend the mission.
c. Document the demobilization plan.

3.0 HOW TO DOCUMENT:

3.1 Several techniques are useful in aiding detailed documentation.

a. Tape recorders.
   - At meetings, briefings, debriefings, etc.
   - Voice activated kind with radios, telephones.
b. Stenographers.
c. Note takers.
d. Key personnel carry small dictation units to record decisions, events, observations, thoughts that are otherwise often forgotten.
e. Microcomputers.
f. Photographs.
g. Video Camera.
VISUALIZING DATA
(by: Hugh Dougher)

SITSTAT: (Situation Status)

The situation unit leader is responsible for the collection and organization of search status and situation information.

Just as a picture is worth a thousand words, information presented visually is easier to retrieve, compare, and conceptualize if transferred to charts, map symbols, and colors, rather than to text. Here are some suggestions:

1. **Assignments and Accomplishments.** List summaries of team assignments both on notepaper for records, and in large letters on flip chart paper or blackboard for quick scanning. Post this list in the Plans Section. Keep up-to-the minute record of accomplishments and the status of field teams in the same manner.

2. **Maps.** USGS 7.5 minute topographical maps are best. Whichever type of maps are used, they can quickly become a nightmare of scribbles, coloring, and general clutter. Data may be lost or poorly recorded, on different maps and forgotten. People will regularly discard used maps for new ones. To avoid these problems, limit all writing to transparencies placed over the maps. The only notations allowed on the maps are marks indicating where the corners of the transparencies should be placed, the PLS or LKP, and possibly a few other important landmarks. This system has many advantages:

   a. Each effort can be recorded on a separate transparency. Important notes can be added to the corner of the transparency, and the transparency can then serve as a detailed record of that effort.

   b. Information can be gathered simultaneously using more than one map station. The completed transparencies are then routed to SITSTAT and can be used by SITSTAT, Plans, Records, and others as needed.

   c. Efforts can be analyzed in different combinations to visualize the types and number of times each segment has been searched, reveal holes in coverage, etc.

   d. The Plans Section can record each assignment on a separate transparency. These transparencies are placed over a map and photocopied. The photocopies are given to team leaders during assignment briefing. This simplifies operations duties, and minimizes confusion and misunderstanding.

   e. The transparencies provide a detailed step-by-step record of both the planning and the accomplishments of the search.
f. SITSTAT should set up at least four map tables: A master map for SITSTAT's exclusive use, two for use by debriefing, and one for the Plans Section. Additional map stations can be added as needed. Each map should be taped to a table top.

3. **Color Codes.** Color code resources for quick recognition. Hatch Graham has proposed the following adaptation of ICS for standardization of colors both in mapping and on T-cards:

- . rose - search patrols
- . green - search crews
- . yellow - search dogs
- . brown - search dogs
- . blue - helicopter
- . white - personnel
- . grey - location labels
- . orange - aircraft

4. **Map symbols.** Boundaries, areas covered, and successive coverages can be indicated by using hachure lines.

To keep current, SITSTAT needs to constantly monitor radio traffic.

**RESTAT (Resource Status):**

The Resource Unit Leader is responsible for maintaining current information on resources status. The T-card organizer is very effective for this. The following categories should be listed:

1. - Enroute
2. - Assigned
3. - Available
4. - Out-of-Service
5. - Released

T-cards come in different colors. For type of resources use the same color codes as described earlier.

\[
P_A = P_D \times P_M
\]

**Meaning:**

Protecting your assets is equal to the proper documentation, times the proper methods.

It is always easier to get too much information and discard what is not needed than to try to dredge up accurate information later.
MANAGING SEARCH BASE OPERATIONS

OBJECTIVES: A student will be able to--

* Identify the various types of search base facilities and explain their uses.

* Describe the major functions of a search base.

* Discuss the factors to be considered in selecting a search headquarters, based on the potential size and nature of the search.

The single most important aspect of Base Camp Administration is Preplanning. Efficiency can be improved considerably by determining ahead of time the location and layout of a base camp.

1.0 TYPES OF SEARCH OPERATION FACILITIES.

1.1 SEARCH BASE - The search base is the location at which primary support and management activities are performed. The base will include all management, equipment and personnel support operations. The logistics section, which is responsible for ordering all resources and supplies, is also located at the base. There should only be one search base established; and normally, the base will not be relocated. If possible, search base locations should always be included in the preplan. The base should be distinguished from a staging area which is a temporary support area. Normally included in the search base operation are:

a. COMMAND POST - Designated as the CP, the command post will be the location from which all incident operations are directed. There should only be one command post for the search. In a unified command structure where several agencies or jurisdictions are involved, the responsible individuals designated by their respective agencies would be co-located at the command post. The planning function is also performed at the command post. Normally the communications center would be established at this location.
b. **CAMPS** - Camps are locations from which resources may be located to better support search operations. At camps, certain essential support operations (e.g., feeding, sleeping, sanitation) can be maintained. Also at camps, minor maintenance and servicing of equipment should be done.

c. **HELIBASES** - Helibases are locations in and around the search base area at which helicopters may be parked, maintained, fueled and loaded with supplies, personnel, or equipment. Once established on a search, a helibase will usually not be relocated.

1.2 **STAGING AREAS** - Staging areas are established for temporary location of available resources on very short notice. Staging areas will be established by the Operations Chief to locate resources not immediately assigned. A staging area can be anywhere in which mobile equipment can be temporarily parked awaiting assignment. Staging areas may include temporary sanitation services and fueling. Feeding of personnel would be provided by mobile kitchens or sack lunches. Staging areas should be highly mobile. The Operations Chief will assign a staging manager for each staging area. The Manager is responsible for the check-in of all incoming resources; to dispatch resources at the request of the Operations Chief, and to request logistics section support as necessary for resources located in the staging area.

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**DESIGNING A BASE CAMP**

- **Considerations** -

1. Grouping of related functions
2. Isolation of functions
3. Access to transportation
4. Flow of personnel
1.3 **HELISPOTS** - Helispots are more temporary and less used locations than helibases at which helicopters can land, take off, and in some cases deliver search resources or supplies.

1.4 **SPIKE CAMP** - Spike camps are small, temporary camps established in the search area and usually service a specific segment or division of a search. Spike camps may serve as a "mini-staging area", or may have a specific tactical function, ie, a Wilderness Trail Block Site.

1.3. **COMMUNICATIONS CENTERED ON PERSONNEL NEEDS**

2.0 **GUIDELINES FOR ESTABLISHING SEARCH BASES**:

2.1 **PROXIMITY TO SEARCH AREA.** Safety, sanitation, and travel time for search personnel should be considered.

2.2 **AESTHETIC VALUES.** Consider the temporary and permanent effects on the area used.

2.3 **PUBLIC INTERFERENCE.** Consider the proximity to concentrations of people, job seekers, curiosity seekers, etc.

2.4 **EXISTING FACILITIES.** Are they of value or are they a hinderance to your overall needs. **EXAMPLE:** Communications - Are there other CB radio operators in the area? Sanitation-condemned outhouses? Shelter - unsafe barn?

2.5 Use an **AERIAL PHOTO OF THE AREA TO PLAN A SEARCH BASE LAYOUT.** It is easier than just letting it grow, unorganized.

2.6 **OWNERSHIP OF THE LAND.** You must first secure permission if the location is on private land. Obtain a written agreement and written release.

2.7 **COMMUNICATION.** Consider the necessary communications that will be needed to the search area dispatch office, within base operations (radio, telephone service), and to the search areas.

2.8 **READY ACCESS.** Consider the distance supplies must be transported. Consider transportation routes to the search area, supply sources, etc. Obtain permission to travel over private lands.

2.9 **TERRAIN** - Safety, and environmental limitations such as slope and vegetation must be considered.

2.10 **SIZE AND CHARACTER OF THE SEARCH.**

2.11 **EXPECTED DURATION.** Project an initial forecast, but plan for additional space for expansion to optimum size should it become necessary.
2.12 **DISPERSION OF SEARCHERS.** Consider the use of spike camps.

2.13 **TYPES OF MANPOWER AND EQUIPMENT** to be used on a search.

2.14 **COMPONENTS OF A SEARCH BASE.**
   a. Command Post.
   b. Staging Area for Personnel and Equipment.
   c. Communication Center.
   d. Transportation Depot.
   e. Media/Medical/Family Areas.
   f. Plans/Operations/Logistic Centers.
   g. Heliport/Helibase Locations.

3.0 **GUIDELINES FOR ESTABLISHING SEARCH CAMPS.**

3.1 **ENVIRONMENTAL CONSTRAINTS** of the selected site and search area. Consult the multiple use plan, land use plan, or any other similar survey that is currently in use for the area.

3.2 **SAFETY AND SANITATION.** Keep the welfare of search personnel in mind.

3.3 **ADEQUATE SPACE.** Avoid congestion and disturbances to camp activities. Estimate the duration of the search, and allow for expansion.

3.4 **WATER SUPPLY.** Is it potable? Could it become contaminated? If unsure, have the water supply checked by public health officials or make other arrangements.

3.5 **SHELTER** from the elements. Wind, sun, rain, snow, etc.

3.6 **SECURITY** for government and personal property.

3.7 **PARKING** for vehicles and heavy equipment. Keep them separate from supply depot areas to enhance security.

3.8 **FUEL STORAGE AND VEHICLE MAINTENANCE AREA.** Post "no smoking" signs.

3.9 **SUPPLIES** - storage, and supply depot. Provide for access and security.

3.10 **CREW ASSEMBLY AND BRIEFING AREA.** Consider including a bulletin board and warming fires.

3.11 **SLEEPING AREAS.** You will need separate areas for day and night search personnel and for the overhead team.

3.12 **LATRINES.** Consider separate facilities for women and men. They must be at least 150 feet or more from a water source and, 300 feet and downwind from the kitchen area. Make sure latrines are accessible to sleeping areas.
3.13 **WASH UP AND SHOWERS.** A requirement of OSHA in poison oak/ivy regions.

3.14 **FIRST-AID STATIONS.**

3.15 **KITCHEN OR MESS.** The location will be somewhat dependent on how the food is to be prepared and served.

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**BASE CAMP LOCATION - Considerations**

- Environmental constraints
- Land ownership
- Terrain
- Access
- Communications
- Safety and sanitation
- Proximity to search area
- Space
- Shelter
- Security
- Aesthetic Values
- Interference
- Water supply
- Existing facilities

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4.0 **GUIDELINES FOR ESTABLISHING THE SEARCH COMMAND POST:**

4.1 **LOCATION** - Consider access, noise and security.

4.2 **ACCESSIBILITY** - Site should be accessible to searchers (ie, bulletin boards, resource status flyers) but secured from the media representatives and the general public.

4.3 **IDENTIFICATION** - C.P. should be well identified with signs, colored tape, etc.

4.4 **FACILITIES** - Provide protection from the weather, lights for night missions and "Creature Comforts" for the Search Management Staff. Consider the needs of the communications and planning staffs.

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5.0 **GUIDELINES FOR ESTABLISHING SEARCH HELIBASES:**

5.1 **Accessibility** - Consider arrival and departure of both aircraft and fuel vehicles. Aircraft should not be allowed to fly over search base.

5.2 **Security** - Helibase and its high hazard facilities should not be accessible to searchers, the general public or media representatives unless approved by the Search Manager.

5.3 **Location** - Consider aircraft flight paths, engine noise control, proximity to food and sleep facilities and control of dust and debris. Helibases should be accessible by ground vehicle, and not be located near the C.P., feeding and sleeping areas or communication center aerials.
6.0 GUIDELINES FOR ESTABLISHING SEARCH STAGING AREAS:

6.1 Location - Staging areas should be located so that available resources can respond for assignment within a very short time.

6.2 Facilities - Although facilities are of a temporary nature, consider the "Creature Comforts" of the resources who will be using them.

6.3 Accessibility - Consider access by both vehicle and foot, and their proximity to both ground and air transportation areas.

7.0 GUIDELINES FOR ESTABLISHING OTHER SEARCH BASE FACILITIES (HELISPOTS, SPIKE CAMPS AND DEMOBILIZATION CHECK-OUT POINTS):

7.1 Functionality - These other search facilities should be designated to service specific functions and objectives.

7.2 Safety - Safety must be a major consideration in locating, using and servicing these temporary facilities.

7.3 Supervision - At times these facilities are located in areas which are not the most desirable; therefore, trained and experienced field resources should be assigned to supervise these facilities.

8.0 SPECIAL FACILITIES PLANNING GUIDELINES:

8.1 What activities could be grouped together in a camp?
   a. Management and plans.
   b. Management and communications.
   c. Latrines, sleeping areas, wash area, etc.

8.2 Which areas need to be the most isolated?
   a. Sleeping area.
   b. Command Post
   c. Helicopter and helibase.

8.3 Which areas need ready access to transportation and facilities?
   a. Management (CP).
   b. Supply.
   c. Equipment area.
   d. Kitchen.
   e. Garbage.
   f. Latrines (chemical toilets).

8.4 What is the desired flow of personnel and vehicles through the base?
   a. Straight lines are the most natural paths for search personnel minimizing walking in dust or mud.
8.5 What is the reasonable distance between functions?
   a. Depends upon the complexity of the search.
   b. Small initial response areas versus large, developed search bases.

8.6 What are physical factors which must be considered?
   a. Physical limitations and capabilities are:
      - Size and shape
      - Terrain
      - Existing roads
      - Existing facilities (i.e., buildings, structures, communications, water, and sanitation facilities).
      - Sun, dust, mud, etc...

8.7 How should the water supply be established?
   a. Water for the kitchen must be adequate and safe.
   b. Locate above other camp facilities.
   c. Protect the area from contamination by signing.
   d. You may need to dig out source and install plastic pipe or hose.

8.8 Where should the kitchen be located?
   a. Level ground.
   b. Good drainage away from camp area.
   c. Minimize dust.
   d. Adequate water supply.
   e. Good shade.
   f. Good lighting.
   g. Cooking, serving and eating areas together.
   h. Access by freezer truck or other cold storage.
   i. Rope off area to unauthorized personnel.

8.9 How should the equipment depot and supply storage area be located?
   a. Adequate space - secured and roped off.
   b. Segregate supplies and equipment by type and condition.
   c. Bins or stalls will aid your "check-out" and "check-in" system.
   d. Provide parking space for trucks, buses, etc.
8.10 How should sleeping areas be established?

a. Downstream from kitchen water supply.
b. Away from dishwashing drainage.
c. Quiet area away from kitchen, trucks, roads, heli bases, latrines, etc.
d. Shaded area for night searchers.
e. Mark or sign separate areas for various search units, if desired.
f. Provide for search manager and overhead team wake-up calls.
g. Designate and supervise areas for warming fires.
h. Provide clothes lines.
i. Provide drinking water.
j. On flat dry ground.
k. Free of snags and other hazards to safety.

8.11 How should the timekeeping or sign-in area be located?

a. Should be placed near the entrance to the base.
b. Provide for lights.
c. Provide tables, seats, shelter and roped off.
d. Away from dust and noise.
e. Plainly marked and easily identified.

8.12 What function should commissary be located close to?

a. Locate with time recorder.

8.13 Where should the communication area be located?

a. Away from timekeeping, kitchen and equipment areas.
b. Convenient to the search manager.
c. If possible, have radio technicians help you locate the site.
d. Provide shelter.

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**FACILITIES TO CONSIDER — When Locating a Base Camp**

1. Parking 7. Latrines
2. Fuel storage 8. Wash & Shower areas
3. Vehicle maint. 9. Heliport
4. Supplies 10. Command post
5. Assembly area 11. First aid station
8.14 Where should the first-aid station be located?
   a. In a quiet area and dust free.
   b. Provide for shade.

8.15 Where should the Search Manager and Overhead Team be located?
   a. Isolate them away from main base activity.
   b. Tables, chairs, lights, and heat (in cooler areas) are a must.
   c. Convenient to communications.
   d. Provide shelter.

8.16 How should washup and showering facilities be located?
   a. Well drained - sand or gravel.
   b. Adequate lighting.
   c. Away from the kitchen.
   d. Provide hot water, benches, basins, soap, towels, and garbage cans.
   e. Separate facilities for men and women, or arrange a schedule for use at separate times.
   f. Have clothes lines available.

8.17 How should latrines be established?
   a. 150 feet from streams and 300 feet from kitchen and sleep areas, as a minimum.
   b. Post direction signs.
   c. Lighted for night use.
   d. Supply with tissue, shovel, and chlorinated lime.
   e. Cover with dirt and level when closing base.
   f. Use chemical toilets whenever possible.

   1) Arrange for service at least once daily.
   2) Locate two latrines near the search command area.
   3) Provide occupied signs or mark them men/women.

8.18 How should garbage disposal be handled?
   a. Have cans distributed throughout the camp. Frozen meal boxes make good garbage containers.
   b. Haul the garbage out daily.
   c. Check local policy before burning or burying garbage.
8.19 How should parking for searchers be handled?
   a. Have vehicles turn around first and park facing the exit.
   b. Keep the turnarounds clear.
   c. Consider vehicles with side opening doors.

8.20 What are considerations for an assembly area?
   a. Have adequate space available to assemble people for general announcements.
   b. Provide a bulletin board.
   c. Install a P.A. system, if necessary.

"A base camp provides the staging area for personnel and equipment and their logistical support - toilet paper, dry clothing, and the 'three hots and a cot.' The base camp is also the home of the central nervous system of the search in the plans, communication, command, operations, and support facilities."

- Tim J. Setnicka, Wilderness Search and Rescue, 1980

9.0 SEARCH FACILITIES SAFETY GUIDELINES:

9.1 Ensure that all personnel are briefed about "in-base" rules, e.g. fires, sanitation, quiet hours, smoking, meals, supplies, area hazards, evacuation plan, etc.

9.2 Have all hazards in the area been identified and mitigated?
   a. flood, flash flood potential.
   b. fire potential, both structural and wildland.
   c. poison oak, insects (ticks, yellow jackets, bees, spiders, scorpions), snakes, animals.
   d. hazardous trees, widomakers.
   e. fuel storage, chemicals.
   f. severe weather hazards, lightning, etc.

9.3 Produce base map, showing evacuation routes, and listing base rules.

9.4 Establish speed limits.

9.5 Ensure that service vehicles have 'back up alarms' and are guided by persons on foot.

9.6 Test all water sources regularly.
9.7 Designate smoking, no smoking areas.

9.8 Designate open fire areas, ensure adequate fire fighting equipment is immediately available.

9.9 Establish camp security.

9.10 Keep list of camp safety rules current; circulate and post.

9.11 Ensure that all flammables are clearly marked and stored in supply area; post and enforce no smoking; storage area should be shaded.

9.12 Properly store liquid petroleum gas tanks; ensure that only trained personnel handle and light stoves, heaters, lights etc. powered by LPG.

9.13 Ensure that sanitation rules for cooking, washing are followed.

9.14 Provide for proper camp hygiene; chemical toilets, latrines, showers, wash areas; monitor, service 2 or 3 time daily.

9.15 Ensure proper use, construction of sump; mark, flag sump area.

9.16 Clearly mark, flag ditches, holes, stumps, etc.

9.17 Provide for night lighting of camp area, pathways.

9.18 Locate generators so that noise and exhaust will not affect personnel.

9.19 Are electrical tools and generators properly grounded?

9.20 Locate all electrical cords; inspect for shock potential; mark them well.

9.21 Are tents, shelters secure and anchored for wind? Flag/mark all anchor ropes, guys, braces.

9.22 Pick up garbage daily; mark garbage pit area.

9.23 Be on the alert for lightening storms and other weather hazards; ensure proper rules are followed.

9.24 Maintain a first aid station.

9.25 Ensure that food is stored properly.
MANAGING EXTERNAL INFLUENCES

OBJECTIVES: A student will be able to--

* Describe the outside influences that may indirectly affect the outcome of a search.

* Effectively manage external influences during a search.

1.0 SIGNIFICANT EXTERNAL INFLUENCES DEFINED

1.1 There are four categories of influences that you as the Search Manager must consider and manage:

- Relatives or others who are close to the lost subject.
- Media.
- Political entities.
- Parapsychological (ESP's, seers, witches, clairvoyants).

2.0 MANAGING RELATIVES - THE GENERAL PRINCIPLES

2.1 Do not ignore them. Take the initiative and contact them. At the search base, locate them in a comfortable place, preferably somewhere away from the center of activity.

2.2 Assign one person to assist them and to provide them with regular feedback on the progress of the search. This should be someone who has real sensitivity to this type of situation and, if possible, someone who has had training in dealing with grief reactions.

2.3 Keep them constantly informed about what is being done. Do not make them come to you for information.

2.4 In some cases, people close to the subject are going to want to, or even insist on being "involved." They feel that they must "contribute" to the effort. This is their way of dealing with stress and uncertainty and, in some cases, guilt. While in most cases it probably is unwise to send a relative out with a search team, often there are some tasks around base camp that can be done. In any case, it makes sense to have someone "available" for confirming the identification of clues.

2.5 Unstable relatives or associates should be headquartered somewhere away from the search base. Idle comments by searchers or accidentally overheard radio messages can cause serious reactions.

2.6 Maintain an atmosphere of encouragement, but do not build up false hopes.
2.7 Find out if the relatives or associates want to be contacted by the media. If not, you may have at least a moral obligation to keep the media away from them, especially in cases when the subject is found dead or in very poor condition.

2.8 Brief all searchers as to the situation with relatives or associates, particularly the location and identification of those who are in the search area or base. Emphasize the need to avoid idle comments.

2.9 Consider having specialists in dealing with grief reactions present or on call to assist the relatives, if needed.

GENERAL GUIDELINES FOR DEALING WITH GRIEF REACTIONS

The following are general guidelines for dealing with family members who are on the scene of a search and rescue operation involving another family member. These are not presented as "cookbook" rules but as general guidelines to understand and use if appropriate.

1. Provide privacy for the family if possible. It is also very important to gently but firmly keep family members from interfering with SAR operations or endangering themselves.

2. Help make them comfortable. Coffee, blankets, etc., are tangible expressions of concern and greatly appreciated. Also, be alert for shock or other physical reactions.

3. Provide concrete information to the family. Have one person who can serve as a liaison between the family and the search and rescue operation. This person should help the family deal with concrete issues that they face and also help them to face reality.

4. Support the ventilation of feelings and, if necessary, help channel them within controllable limits. Avoid aggressive confrontation with irrational beliefs by the family. They may need those beliefs as protection against the shock of the loss.

5. Support continued professional or paraprofessional help. If the family is willing to get support but appears immobilized by events, make the contact for them. Friends, clergy, or others close to the family can be helpful at this time and can serve in the liaison role.

6. In fatalities, to help avoid additional stress at the scene, it may be advisable to suggest that the family leave the area before the subject is brought to the base camp. Simply advise the family that the subject has been located and where the body will be taken. After the family leaves, then remove the subject, thus avoiding a stressful situation for both the search personnel and the family at the scene.
3.0 MANAGING THE MEDIA - THE GENERAL PRINCIPLES

3.1 Understanding the Media - The role of the media is to educate and inform the public. This often involves disclosing how responsible officials are handling an incident and providing perspective. In communicating information to the media, the byword is: KEEP THEM INFORMED. Do not make them seek out information. Establish regular and frequent reports to them. Respect their reporting deadlines, such as for the "6 O'clock news." Remember, if you do not give them information, they will get it from somewhere. And often what they get will be inaccurate or unflattering.

3.2 What Can You Expect?

a. Media reporting often will go through three fairly distinct phases:

1. **Concern for the lost person.** They will share the early feeling of the concern for the subject and show genuine concern for you, your people and the job you have to do.

2. **Accusation.** This will follow if the subject isn't found quickly. Generally they'll assume something has gone wrong, so there is going to be a hunt for who did it. Expect to be asked, "When are you going to stop screwing up?"

3. **The story behind the news.** After the two above phases, the search for controversy and the story behind the news will start. What really happened and why? Why and what are you covering up?

b. If we reflect for a few moments, we will realize these three phases are logical processes that our own minds follow as we witness news unfold. We should not be surprised nor upset that the media seeks information to support these needs.

3.3 Characteristics of the Major Media. Each of the three major media has a different audience, different deadlines, and different needs.

a. **Newspaper:** Generally only one or two major dailies cover an area. They have a critical need for pictures and details and their deadlines are tight.

b. **Radio:** Most areas have a number of stations that provide immediate coverage. They will be especially interested in actual voices from the major players to give their story maximum impact.

c. **TV:** Generally there are only 2 or 3 stations in an area with any significant news capability. Here the need is for short film clips of the story for coverage on the noon or evening news. There is a growing trend, however, toward live coverage whenever a story is in progress.
"Reporters are like alligators. You don't have to love them, you don't necessarily have to like them. But you do have to feed them."

- A Senior Reagan Administration Official, Economic Summit, Tokyo, 1986

d. Be aware of the audience each medium will reach.

1. Newspaper readers are mostly more than 30 years of age.

2. Most television viewers are age 18 or younger and age 35 or older. Viewers aged 18-35 are more selective about the programs they choose.

3. Radio is primarily a medium for teenagers. However, some stations are geared to reach specific kinds of audiences.

3.4 Managing the Media Response to the Search Incident:

a. Always designate one person as the media liaison - a Public Information Officer (PIO).

b. Try to confine the media representatives to one location.

While this is not always possible, it is less disruptive if they can be kept out of the search area. One technique often used with success is to "bar" them from the search area, but arrange regular trips (once or twice a day) for the media, as a group, to the base so they can get photos, etc.

c. Another useful technique is to have media representatives designate a "pool" reporter or reporting team that will represent the interests of all. This is particularly useful in situations such as arranging for a "media" flight over the area, or talking with relatives, etc.

d. Brief all searchers as to location of the media and who the media liaison is. If possible, demand that no one but the media liaison make statements to the media without permission.

e. As the Search Manager, you should try to attend at least one media conference each day. This gives them the opportunity to "get it from the horse's mouth."

f. Give frequent reference and credit to all the organizations involved in the mission. Volunteer organizations, especially, thrive on recognition.

g. Take advantage of the opportunity! Remember, you are the expert, and media people are people. Talk to them.
h. **Establish fair and uniform rules.** These will be followed if scrupulously enforced. Media representatives can wait for an aspect of the story as long as no one else is getting it ahead of time.

i. Never, **never get into an adversary position** regardless of the provocation.

j. **Establish good access** for your media spokesperson and ensure that he/she remains fully informed so that he/she has credibility.

k. Whenever possible, **deal with reporters individually** rather than in groups. You'll be better able to control the substance of what you say, and you'll be more likely to leave the reporter with a sense that he/she must be fair with you. Reporters in groups tend to play to each other, often at the expense of the source they're interviewing.

l. **Think of the public's interest** in your story - that's usually the way a reporter looks at it.

m. Your information operation must **use current technology** to effectively disseminate information. The news media shouldn't be able to disseminate information faster than you can get it to them.

n. **Use enough staff** to get the job done properly. It can't be done with mirrors, and you rarely get a chance to do it over if it wasn't done properly the first time.

o. **Protect your credibility.** Don't join forces with an organization that is capable of tarnishing your image through its own poor performance. If you are forced to appear jointly with them before the media and public, make sure the media knows what information for which your organization is and is not responsible.

p. Don't forget to **disseminate information** to those parts of your own organization that normally dispense information (e.g., switchboards, dispatchers, higher authorities.) People often first turn to traditional information sources before the media.

q. Although the complexity of the incident may require you to have several people answering questions, make sure they are **all reading off "the same sheet of music"**. A single public information person must clearly be in charge to ensure this.

r. A news release issued during a complex mission is a luxury. Often events change the situation too rapidly. **Consider issuing fact sheets**, with quotes for distribution (from key staff) whenever appropriate.
s. **News releases should stick to the known facts;** often this will mean you can describe the nature of the mission, but not the aspects still under investigation.

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**THE MEDIA SERVES ITS AUDIENCE. . .NOT YOU!**

but

Trust the public. The common man is smarter than you think!

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3.5 **Considerations when being Interviewed**

a. **Be prepared.** Be ready to provide expert opinion to a non-expert and to provide it in the easiest possible way for him/her to understand it. What might they ask? Who, what, where, when, why? Call your PR people for help.

b. **The best answer if you don't know the answer to a question is, "I don't know".** Always offer to tell what you or your organization is doing to find out (if that's appropriate). And when you find the answer, keep your promise and tell the questioner and all others interested in the answer.

c. **Avoid answering questions which call for speculation on your part.** The media will push for opinions such as "Do you think you will find Johnny alive?" Either a yes or no answer to this speculation. Something like, "We're doing everything we can to find him as soon as possible.", may be a more appropriate response. Promise to get facts and then produce them.

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Don't risk off-the-record comments. The reporter's ground rules may not be the same as yours.

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d. **Be clear and to the point.** Don't "beat around the bush".

e. **Start any statement with a direct - calmly expressed - sentence about what is happening or what is expected to happen.** Immediately follow that with a description of what authorities have done in response.

f. **Answer the questions as briefly as possible without being short, reticent or uncommunicative.**

- Don't be glib or attempt to add a light touch. When you are talking about people's lives or well being, they're not laughing.
g. **Don't panic.** If you lose control, how can you expect the person on the street to maintain control? Admit problems if they exist, but point out your positive efforts to correct them.

h. **Your attitude should be open, friendly and helpful.**

i. **Use "Plain talk."** How would you explain it to your nephew?

j. **Be yourself!** Don't attempt to change your voice or sound differently. Don't play-act or try to be someone else. You have done very well as the person you are.

k. **Avoid jargon.** Using technical terms such as military or police idioms, confuses the public or leads them to think you're hiding something.

l. **Watch out for emotional "buzz words."** The use of ethnic labels, an inappropriate term, or disparaging characterizations of groups or individuals involved can create mini-crises of their own.

m. Don't win a battle at the price of losing a war. In short, **don't fight with inquiring reporters.** You might win the first round but you'll lose in the long run.

n. **Don't make it worse than it is,** but don't try to make it better either. Stick to the facts.

o. **If you cannot control your anger or keep your voice in check during times of stress,** have someone else act as spokesperson for most of the media presentation. Then, remain available for answering questions that the spokesperson cannot.

p. If a question offends you or distorts the subject, ask the reporter to reword it, or reword it yourself.

q. **Avoid exaggeration** - stick to the facts - don't chance giving the reporter the impression that you're trying to manipulate the story or give yourself or your agency a favorable impression.

r. **Whatever you think is most important is what you should say first.** Reporters are not expert at shorthand, so they take down as much as they can remember of what you started your thought with, and that's what is most likely to be quoted.

s. **Keep calm - don't lose your cool.** If you lose your temper, that will be the story, not the substance of what you said.

t. **Be candid, be honest** - if you give a reporter any reason to be suspicious of your integrity, he'll find a way to trip you up.

u. Some reporters may warp your words or take them out of context, but in the long run the reporter's credibility with his editors will suffer. **If you think you have been mistreated in a story, tell the reporter** - remind him that you want accuracy and fairness more than you want attention.
v. **Emphasize the positive action** authorities are taking to alleviate the situation.

w. **Don't talk down to the public through the reporter:** they'll know it and resent it.

x. **Don't ever say, "No comment".** To a mass audience you are saying three possible things by such a statement: "I don't know"; "I know but I'm hiding the information"; or "Go ask someone else". That someone else could say something a lot worse than what you might be forced to reveal.

>"The closer you are to the facts of the situation the more obvious are the errors in all news coverage of the situation."

y. **Don't fall into interview traps:**

- If the reporter's questions put you in a negative light, admit it, and then explain the corrective steps that have been taken.
- Don't repeat the reporter's terminology unless you like the words.
- Beware of false assumptions, conclusions and "facts".
- Avoid answering hypothetical questions.
- Listen to the whole question before you respond.
- Be alert to the multiple question: ask for the questioner to repeat the parts for you and/or pick the part you want to answer.
- Beware of the "speed-up" technique in which the reporter shoves the microphone back and forth rapidly between the two of you.
- Beware of the "stall" technique in which the reporter leaves the mike in your face after your answer, hoping for you to say more. Don't be afraid to look him/her in the eye, smile, say nothing.............and wait.
- **Things to watch out for........Questions that are:**

  *leading
  *double-barreled
  *technical
  *hypothetical
  *background
  *off the record
  *pressure or just plain bluff

When meeting the media, the best possible attitude is to be able to say, "I'm glad you asked!" and mean it. It is your opportunity to present yourself and your organization to the public.

There are, however, other occasions when confronted by a hostile media, that the best you can possibly say afterwards is "I don't think I hurt us any."
3.6 Television - The Approach is a Little Different

a. Television is an emotional medium, not an intellectual one.

b. Viewers will often forget the content of your message but remember your style - how you looked, how you behaved, and the quality of your voice.

c. Check your appearance, and then forget it. You can't change your clothes or your hairline on a moment's notice. Instead, concentrate on the questions you may be asked.

d. The way you are perceived on television is frequently quite different from the way you are accepted in person. Remember that while preparing: sit upright at your desk, or in the chair. (Don't lean backwards, or away from the camera.)

e. Look straight ahead; don't look up for guidance or down to hide.

f. Concentrate on the questions being asked. Be aware of any bad information built into the questions. If it's incorrect, challenge it!

NEWSPAPERS TRANSLATE COMPLEX IDEAS BEST.

TELEVISION LEANS TOWARD ACTION AND ENTERTAINMENT. IT'S AN INTIMATE MEDIUM.

RADIO TENDS TO BE CASUAL AND PERSONAL AND LIKES STORIES ABOUT PEOPLE.

COMMUNITY NEWSPAPERS WANT NEWS THAT DIRECTLY AFFECTS THE COMMUNITY.
3.7 When a reporter calls on the phone, be on your guard!

a. Assume he/she wants information that can be published or
   recorded and broadcast.

b. Always assume you are "on the record."

c. Rules for dealing with the media by phone:

   ✓ Establish who you are talking to.
   ✓ Establish what the information is for.
   ✓ What are the deadlines the reporter has to meet.
   ✓ Check reporters knowledge...Listen!
   ✓ Listen again...make sure you understood the need.
   ✓ Then - fill in the background
     - answer the questions
     - or, find out and call back.
   ✓ If you can't answer, explain why.
   ✓ If possible, get someone who can help.

d. Always keep callback promises, provide references and/or
   research the material.

3.8 Dealing with the "Unprofessional" or Unscrupulous Reporter.

a. We often assume a much higher level of professionalism by those
   who work in the media than is sometimes there. The absolute
   minimum requirements for a radio announcer, for example, is
   the ability to read -- nothing else. Often in small communities,
   part-time students who know very little about professionalism
   of the industry, are hired by radio and newspapers. They may, at
   times, perhaps unknowingly, violate your agreement or quote
   you out of context, or misquote you; or use unscrupulous
   methods of getting information.

b. You have a means of recourse in such instances. Discuss the
   incident with the reporter first and then with the editor. The
   editor will want to know about such instances. However, if the
   editor does not agree with you, you may have no further
   recourse. You may want to advise the editor that if they want
   any further information from you, they should not send that
   reporter.
3.9 **Summary**

a. **The Problems the Media must deal with:**

   - **Look at it from their perspective:**

     a. Information unavailable.
     b. Kill the messenger syndrome.
     c. Fears that the media distorts information, leading officials to withhold or sanitize information.
     d. Other local, state and national media.
     e. Scientists!
     f. Conflicting opinions.
     g. Technical/Logistical problems.
     h. DEADLINES!

Far too often, the relationship with the media on a mission is an adversarial one. This helps no one. To avoid this, PREPLAN all media aspects. **Manage** this influence - do not let it control you. Meet and greet. Being able to talk with reporters on a first name basis is easier than regarding them as adversaries. **The media can be used to advantage, if a good relationship is established. For example:**

- Assistance in obtaining information, resources.
- Emergency preparedness education.
- Funding or donations, especially to volunteer groups.
- Public relations.
4.0 MANAGING CONTACTS WITH POLITICAL ENTITIES.

4.1 Two situations can occur that involve political influence:

a. A politician or VIP is the lost subject.

b. Media publicity or family contacts can generate interest by political entities.

4.2 In either case, the principles of managing contacts with political entities are the same.

a. In some cases agency policies will dictate how to deal with political contacts.

b. Assign one person as the liaison with the interested party or parties.

c. Take the initiative and keep them informed. Call them before they call you. Many of the principles of dealing with the media are applicable in dealing with political entities as well.

d. Recognize that everything becomes a bit more "touchy." However, if you are managing an effective operation, there should be little need for changes. This type of influence simply heightens the need for doing really well those things that "show," such as media briefings, investigation and background checks, searcher briefings, documentation, etc.

In dealing with relatives, media or political influences, remember: HONESTY REDUCES RUMORS.

TACT is when you can tell somebody where to go so nicely that they actually look forward to the trip.
- Snowshoe Thompson
5.0 **Parapsychological Influences:** (including ESPs (Extra Sensory Perceptions, SEERs, WITCHERS, CLAIRVOYANTS)

5.1 A major search will generally always bring out these type of people. As a rule, they should be taken seriously because millions of people believe in them and a significant percentage seem to be genuine.

5.2 When a search effort extends un successfully over a number of days, friends, relatives and even some searchers can begin to clutch at straws. If these types of influences are readily available, there is a tendency to place a strong emphasis on their use.

5.3 Even though you believe the person who claims to have psychic powers is a charlatan, they deserve consideration, if for no other reason, than for appeasement to family and loved ones of the missing person.

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**General Guidelines for Handling Psychic Influences**

1. Determine the person's motives and method by which they learned about the search incident.

2. Do not let them into the field without an escort or qualified overhead team member.

3. Beware of those who want to charge!

4. Do not let them talk to family members alone.

5. Beware of media contact with these people as an influence on family members.

6. With a proper escort, do not hesitate to allow them into the field to show you where they think the subject is located.

7. If they are unsuccessful during several attempts in the field, discourage further dependence on their use.

8. Always include them into your overall search strategy.

9. Consider their "success" rates. (i.e., those that have been used by other law enforcement agencies.)

10. Never dismiss a psychic influence as far fetched or beyond reality! They just could be genuine.

11. Don't let these influences become a drain on the efforts to implement your objectives and search plan.
DEALING WITH RELATIVES
- General Principles -

1. Don't ignore
2. Show them what is being done
3. Assign one person family assisting responsibility
4. Have available for I.D. of clues
5. If unstable, try to ESCORT from area
6. Brief all searchers concerning relatives
7. Encourage, but don't build false hopes
8. Do they want PRESS? If not, protect them
RESCUE/RECOVERY CONCEPTS

OBJECTIVES: A student will be able to --

* Identify the four phases through which a SAR operation proceeds in order to accomplish a successful rescue.

* Discuss the concept of managing the rescue/recovery phase of a SAR operation.

* Develop an evacuation plan.

1.0 AN OVERVIEW OF RESCUE/RECOVERY

1.1 Every SAR mission has an underlying structure, or framework. Studying and acknowledging this structure is necessary for any person involved in managing the mission. Awareness of the structure enables a quicker, safer, faster response in dealing with the rescue/recovery situation.

1. When do you begin a rescue plan?
2. Analyze potential for Special Rescue Problems.
3. Identify Rescue Resources.

2.0 HOW DOES RESCUE/RECOVERY FIT IN THE OVERALL SEARCH FUNCTION?

2.1 All complete SAR operations proceed through four phases. The four phases are:

✓ Locate.
✓ Reach.
✓ Stabilize.
✓ Rescue or recovery. Evacuate

2.2 Locate - This phase may take only five minutes, such as using a pair of binoculars to locate someone stranded on a rock face. Or it may take many days such as in the case of a complex search.

2.3 Reach - This may range from walking to the base of a cliff, taking only five minutes, to rappelling halfway down a 2300 foot rock face, to being flown onto a remote glacier and establishing contact with a located downed aircraft.

2.4 Stabilize - This includes caring for any injuries as well as providing for physical comfort and safety of the subject. The injuries may only be potential ones, prevented by water or warm dry clothing, or they may be real ones such as a fractured femur or severe hypothermia.
2.5 **Rescue/Recovery** - Again, this may be very simple, such as leading someone down a trail, to an extremely difficult evacuation on a vertical rock face, or the recovery of a body by helicopter hoist.

3.0 **PLANNING IS THE KEY TO EFFECTIVE RESCUE/RECOVERY**

3.1 The core elements of rescue/recovery can be broken into six problem-solving components:

(1) **Pre-planning Vulnerability Assessment**: As an initial pre-planning effort, any Search Manager should have identified not only potential problems and environments, but the whereabouts of any specialized resources to solve those problems.

(2) **Notification**: You are made aware of the location or possible location of subject(s) and his/her/their condition (e.g. unhurt, dead, injured). The notification that the subject has been found changes the incident from a search to a rescue or recovery.

(3) **Size Up**: The total information gathering process about a situation in order to effect an efficient rescue or recovery.

- This size up should be ongoing, starting even before the notification and is linked to the next phase....

(4) **Planning**: After choosing one course of action, at least two alternate plans are also formulated. Whatever plan is chosen should be flexible.

- Three elements (reaching, stabilizing, rescue/recovery) should be considered simultaneously

- Reaching and rescue/recovery involve five field choices:
  - Going up.
  - Going down.
  - Traversing across or over.
  - Air operation.
  - Combination of the above.

(5) **Doing it**: Field implementation phase is based on previous planning steps.
This phase has its own technology and many references are available relating to the skills and techniques. This phase is often the most dramatic and highly publicized.

(6) **Critique:** Any rescue/recovery operation should be critiqued at the end of the incident (see Post Mission Considerations).

To really be READY for rescue or recovery and to carry it out effectively, planning for it must begin almost immediately after the first notice. Alternatives must be constantly analyzed and revised, based on:

- Time elapsed.
- Possible locations where subject may be found.
- Weather.
- Hazards.
- Availability of rescue/recovery resources.
- Reported changes in subject condition.
- Availability of medical resources.

4.0 "LIMITING" FACTORS OF RESCUE/RECOVERY OPERATIONS

4.1 Time is generally thought of as the way of measuring "speed," or lack of it on a rescue or recovery.

- Should we fly or walk?

4.2 Speed is often limited by physical factors such as the availability of resources (e.g. helicopter or good skiers); or by environmental factors (e.g. darkness, rain, etc.).

4.3 However, in a broader spectrum, **safety** is the ultimate factor in considering how and how fast to do an operation.

- If it is not safe to fly, walk, ski, etc., then it is not done regardless of other factors.

- Safety says "yes" or "no" to plans and actions.

5.0 RESCUE AND/OR RECOVERY ENVIRONMENTS

5.1 Teams of rescue personnel throughout the nation are called upon frequently to solve complex problems in a wide spectrum of environments. The manager in charge of such a rescue, whether at the end of a long search, or responding directly to a person in distress, should realize that most such incidents are solved by well-trained specialized resources, not just by dedicated responders.
5.2 Because of the critical need for these specialized skills and the absence of any up-to-date, widely accepted technical manuals, each agency, rescue squad, or volunteer organization has developed its own training standards, capabilities, and techniques. While some are credible and technically correct, many have undoubtedly contributed to the death of would-be rescuers. The entire process of rescue (locating, reaching, stabilizing and evacuation) must have continuity, consistency of nomenclature, and most of all, a firm foundation in training and planning.

5.3 Some of the specialized environments and associated problems that a rescue scene manager may have to deal with include:

- Mountain
- Vertical rock
- Vertical ice
- Snow & blizzard
- Avalanche
- Crevasse
- Cave
- Mines
- Abandoned wells

- Air shafts
- Whitewater streams
- Coastal whitewater surf
- Flash floods
- Slow rising floods
- High winds
- Sea & lake
- Ice

5.4 While each of these presents unique problems to the rescuer in the field, the rescue scene manager's job may well change very little. Here again, identification and proper use of specialized resources would be the key factor in each case.
RESCUE/RECOVERY "THOUGHT PROVOKERS"

1. Use technical personnel for technical rescue.

2. If the subject is deceased, evacuate only if and when there is no risk to rescuers.

3. Stabilize the subject before evacuating, if possible.

4. Decide on the easiest route.

5. Appoint someone to serve as route-finder, with a radio and markers, to report potential hazards, problems, etc.

6. Use litter teams of 6-8 personnel. Normally, no more than 20 minutes per shift. You need three (3) teams minimum. You may also need others to carry other equipment.

7. Use accepted procedures to care for and protect the subject.

8. A radio carrier brings up rear.

9. If using a helicopter for evacuation, make sure:
   - That the subject is informed and briefed.
   - That the subject is protected.
   - That someone goes with the subject who knows medically what has been done.

5 PROBLEM SOLVING COMPONENTS OF RESCUE/RECOVERY

1. NOTIFICATION

2. SIZE-UP

3. PLANNING

4. DOING IT

5. CRITIQUE
DISASTER AND URBAN RESCUE: THE NEXT STEP IN SAR OPERATIONS

While some will insist that urban rescue is a fire department responsibility, in many parts of the country it is done exclusively by law enforcement and in other locations, the function is carried out by EMS or volunteers.

Urban search and rescue operations include the location of people incapacitated and in need of assistance, the stabilization of those individuals, then their removal to a place of safety by means of light or heavy rescue techniques. That place of safety may be an evacuation/relocation center, a field first-aid station, triage center, casualty collection point, hospital, or the morgue.

It is a known fact within rescue circles that the wilderness climber, Mountain Rescue and the industry that supplies their equipment has changed the science of light rescue entirely over the past decade. The state-of-the-art has quadrupled in equipment and technology. While the state-of-the-art is high, the dissemination of that information to agencies and volunteers who need to know is extremely poor. Only recently have urban rescue squads, fire departments, EMS responders and law enforcement officers begun to use and modify the techniques and equipment of Mountain Rescue and the recreation climber to fit the urban rescue needs.

Heavy rescue is a function that has been left to ad-hoc, hit and miss familiarization by private construction, government public works and engineering departments or federal engineering agencies over the past two decades. Very little formal standardized training has been done for that period of time as well. If the need arose, officials grabbed whatever equipment and expertise was available and hoped it was sufficient to do the job. Little consideration was given to architectural engineering, safety, use of specialized equipment and most of all, coordination and cooperation with the light rescue resources involved.

Cursory investigation into the area of heavy rescue has pointed out several significant factors. First, definitions of heavy rescue are widely diverse and little or no consensus can be found within the rescue field on exactly what constitutes heavy rescue.

For the purposes of our discussion here, heavy rescue constitutes the use of heavy machinery and/or lifting and shoring devices/methods, identification and location of those resources, and any related skills and techniques that make buildings, structures or below ground openings safe for victim extrication. This would include, but not be limited to architectural design study, engineering concepts of load bearing structures, lifting problems and capacities as well as tunneling and excavation principles.

During a major disaster, the complexity of rescue problems would increase dramatically. Individual preparedness, resourcefulness and the ability to improvise would be essential to rescue squad efficiency.
In a city shattered by a major magnitude earthquake for instance, responders would have to remain on the job, functioning at top capacity for extended or indefinite periods of time. Normal supply lines and service industry channels may be cut or non-existent; support and re-enforcement personnel may not be able to reach certain areas for several days. We recognize that the mental attitude and psychological adjustment of these rescue personnel will significantly affect their capabilities. They must be well prepared with adequate life sustaining equipment, clothing and survival skills as well as the knowledge to do their job.

Although search and rescue operations in this type environment may seem markedly different from the wilderness and rural settings discussed in this text, the skills and management techniques remain the same. The reality of major disasters, such as the Mexico City Earthquake of September, 1985 emphasizes the need for better cross training in this environment. Experience has shown us that the majority of our wilderness search and rescue resources will be relied upon when these disasters strike. Training for urban SAR is the next step up in overall preparedness and adds further emphasis to maintaining and sharpening these invaluable responder skills.
THE VICTIM NEEDS YOUR ABILITY.
DON'T ARRIVE ON SCENE UNABLE TO THINK, ACT OR PERFORM EFFECTIVELY.
SUSPENDING THE MISSION

OBJECTIVES: A student will be able to--

* Identify the key factors involved in deciding to suspend a search mission.
* Discuss the importance and inter-relationships of these factors to the suspension decision process.
* Outline the elements of a limited, continuous search.

INTRODUCTION

Obviously, if the missing subject is located, the decision to suspend the mission and initiate demobilization and post mission activities--is fairly straightforward.

But, what happens when the missing person has not been located and, as the Search Manager, you are encountering serious pressures (perhaps self-generated) -- to suspend the mission?!!

The following considerations are presented as a "guide" or aid to the Search Manager -- who, at one time or another -- will be faced with the responsibility of suspending the mission when the subject has not been located!!

"The act of suspension is simple - a short message is broadcast over the radio net. But the process of arriving at that verdict is one of the hardest and most important decisions that the search manager will ever make."

- Tim J. Setnicka, Wilderness Search and Rescue, 1980

1.0 THE TWO BASIC QUESTIONS TO BE ANSWERED ARE: 1) are we searching (at this point) for a person who is (most likely) deceased or living? And, 2) is the evidence now pointing to the conclusion that the subject is no longer in the search area?

1.1 There are (4) main considerations to be evaluated:

a. What are the chances of the subject being alive?
b. What is your assessment of search area coverage? (90%, 80%, or less?)
c. At this point, what is your assessment of searcher safety?
d. What is the overall family political climate? What pressures or counterpoints are being exercised?
2.0 FACTORS TO EVALUATE IN CONSIDERING SUSPENSION OF A MISSION.

- Increasing evidence that a person is not in the area?
  a. Have all the search zones (area) been searched and re-searched.
  b. Has there been a thorough and effective execution of the search plan?
  c. The question of survivability of the missing person has been thoroughly re-searched and studied.
  d. The safety of searchers does or does not warrant further continued effort.
  e. Are there any unresolved or unanswered clues?
  f. Have your search resources been depleted? Is there increasing counter pressure to release searchers and their equipment? What is the availability of replacement resources?
  g. Is there political and/or family counterpressure to continue or maintain the search?
  h. Other SAR incidents occur (contemporaneously with your current efforts on the mission) and the other incident demands a higher priority (response).
  i. The current and forecasted weather has been examined in light of continuing the search.
  j. Are there any serious equipment malfunctions? i.e., a radio repeater.
  k. A continued search effort is no longer affordable or practical from a cost standpoint.
  l. Other??

Perhaps in analyzing your search data, relative to suspending or continuing the search, you notice that the search areas were really poorly defined.

Perhaps your assessment to continue or suspend is related to a combination of these or like factors. (Nothing significant in and of itself but, when viewed collectively.........)

3.0 THE DECISION TO SUSPEND A SEARCH USUALLY INVOLVES A COMBINATION OF THESE FACTORS:

Each mission is different and the decision to suspend must be based upon the facts and efforts of the particular mission in question.

3.1 Technique

Use a group consensus technique as a vehicle in helping you (as Search Manager) in making the final decision to, or not to, suspend the mission.
NEVER SEARCH PLAN BY YOURSELF

Have each person review each of the significant factors, assign his percentage of probability or value ranking (scale 1=low; 10=high) or -- simply list for or against.

EXAMPLE:

<table>
<thead>
<tr>
<th>Factors</th>
<th>For</th>
<th>Against</th>
<th>Rank</th>
<th>Decide</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Safety of Searchers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Weather</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Unresolved Clues</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Etc............</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Make a decision yes or no. Then, before finalizing, consider one additional technique.

4.0 LIMITED CONTINUOUS SEARCH

4.1 What and How?

a. Overflights -- over the search zone on an intermittent or infrequent basis.
b. Detection of clues -- A modest search effort for any "new clues", (e.g. original search under snow cover; when snow melts--look again).
c. Signs -- Post signs at campgrounds and trailheads to inform the public that a person is missing in this area.
d. Inform public and media -- Particularly people who may be going into the search area (during an impending hunting season.)
e. Use the search zone(s) for training exercises -- Further ground search technique training programs could be conducted in search zone.

4.2 If you elect to use the limited continuous search technique versus suspending all efforts or terminating. You have:

a. Suspended the "mission" -- but not the search.
b. Continued the search -- on a limited basis.
c. The case is still "open" (missing person).

4.3 This concept is important because:

a. If additional clues are found or information becomes available, you are ready to take additional action.
b. Communicates to survivors/media that you have not given up.
c. Reminds you that as the Search Manager, one of your responsibilities in suspending the mission is to gather the necessary information during demobilization that can provide a knowledge base, should you and others in the future decide to reactivate the mission.

**Overall, what we have covered is the difference between mission suspension and termination.**

5.0 **IDEAS AND TECHNIQUES FOR A FINAL OR CLOSEOUT DEBRIEFING SESSION.**

General debriefing techniques have been identified in the briefing-debriefing chapter.

The final closeout or debriefing sessions that you, as search manager, hold with each team leader and overhead team members constitutes your final opportunity to gather the facts and suggestions you need in preparing for the search critique session.

5.1 **Objective:**

Collect, record and exchange information on what happened during the search and assess effectiveness.

Remember: People are limited in time, often tired, so be organized.

5.2 **Consider these criteria:**

a. Interview team leaders one at a time. Consider using a tape recorder, secretary, or other note taking aids.

b. Review the exact terrain covered, refer to maps, worksheets, logs.

c. Review the percent of coverage and configurations. Number of sweeps?

d. Identify any clues found during the search. By whom? Where?

e. Discuss any hazards (searcher) observed. Safety?
f. Give instructions on what to do now, including any assistance needed for search critique. Appear? Write up report on team's actions? Etc....

g. Discuss: How did each leader perform? How did I do as Search Manager? How well did "we" do as a team?

h. Discuss: Feedback. Too little, too late? Just right?

i. Other operational concerns or events relative to the team

j. Identify what is needed to improve? Minimum standards? Physical fitness? Practice? etc...

k. **Summarize** information obtained from debriefings. Evaluate new things you tried, trends, common problems.
This information will form an important base for the search critique.

Remember to keep records on all the information pertaining to your decision to (or not to) suspend the mission.

SUSPENDING THE MISSION
- DEMOBILIZATION
Remember! You’re not finished until you’ve done the paper work.
DEMOBILIZATION

OBJECTIVES: A student will be able to--

* Describe the principles and techniques of demobilization.
* Identify the six parts of demobilization plan.

"A written demobilization plan should be required on any large search, as a function of the plans and support crew. Orchestrating demobilization takes teamwork due to the complex nature of providing a small army with food, shelter, and transportation home."

- Tim J. Setnicka, WILDERNESS SEARCH AND RESCUE, 1980

1.0 PRINCIPLES OF DEMOBILIZATION

1.1 **Definition** - Demobilization is not a mirror image of mobilization. When we mobilize for a search, a number of individuals in widely separated places direct, coordinate, and provide transportation to get search and rescue resources to a single point. Demobilization is the responsibility of a few people to get these same resources back to the same widely separated places they came from. While command and communication channels remain the same as with mobilization, the procedures may be different.

1.2 **Timing** - Information regarding places of origin, methods of travel, travel times, etc., for search resources should be collected at the time they initially check into the base camp. Collecting and organizing travel manifests may be a simple way of accomplishing this task. Records on the unit must be complete; showing places of origin, method of transportation to search area, home unit, unit leader, etc. Logistic capabilities must be assessed. You may need additional recordkeeping personnel to catalog logistic capabilities and obtain additional information.

**Formal demobilization planning should begin well within the first-half of the expected duration of the mission.**

1.3 **A written demobilization plan is essential.** The plan must show release priorities; release procedures and processing activities; who, by name, is responsible for what, and a schedule.
1.4 **Control** - Control over resources is an absolute necessity. This control should be exercised from base camp to home base. In addition to the obvious need for control to ensure safety and cost effectiveness, there are the concerns of units away from home about being available for a new assignment in their own area. There are many unforeseen delays that could occur and priority adjustments can only be met through rigid control.

1.5 **Communications** - Adequate, rapid communications among all key personnel and facilities involved in the demobilization effort are essential. Demobilization communications should be different from those involved in the ongoing search effort. (i.e. different frequency, high band vs. low band, command and control separate frequencies, etc.)

1.6 **Staffing** - Staff the demobilization organization to fit the needs of the plan. Both facilities and personnel must be considered. The more complex the operation the greater the need for highly qualified facilitating personnel. Staff early and adequately.

1.7 **Teamwork** - Demobilization invariably functions better as a team effort. The involvement of all the overhead team in the demobilization planning and execution is crucial.

1.8 **Safety and Cost Effectiveness** - Tired people make mistakes and are often impatient. Adequate rest prior to demobilization takes on added importance when long travel times are anticipated. Do not sacrifice safety and cost effectiveness for speed. Keep the resources in base camp until priorities and transportation arrangements are confirmed.

2.0 **THE DEMOBILIZATION PLAN**

2.1 **Plan Preparation** - The demobilization plan is prepared by the Demobilization Coordinator in close coordination with the other top search overhead personnel.

   a. Termination (sudden) vs. Suspended (scaled down).

      - Each of these requires different demobilization approaches.
      - Priorities of release may be different.
      - Coordination and organization may be more or less difficult depending on sudden termination or scaled down operation.
2.2 The demobilization plan consists of six parts:

a. **General Information:**

   - Includes orientation information and general discussion of the demobilization procedure to be followed. May include overall situation information or specific instructions.

b. **Responsibilities:**

   - Spells out the responsibility for the plan initiation and specific responsibilities by name for various implementation activities. Establishes a chain of command and outlines the activities at each location or processing point. Determines who is in charge at each location or processing point.

c. **Release Priorities:**

   - Release priorities will be determined by the search manager depending on the situation and by the logistics function depending on transportation availability. Late night releases or travel should be avoided. Always try to release resources in "good condition" - rested, showered, fed, etc.

   **Example:** Release Priorities: Aircraft first, then Volunteers vs. Paid, Overhead team leaves last.

d. **Release Procedures:**

   - This section spells out the various steps in the release procedures (e.g., Plans: to support services, to bus loading area, to showers, to home, etc.) Be specific!

e. **Organization and Flow Charts:**

   - Include: forms to be used, anticipated travel or standby times, T-cards, routes and methods of travel, procedures to take place at each stop and any other instructions that may prove useful in preventing confusion.

f. **Directory:**

   - Telephone directory, maps, routes of travel, etc.
3.0 LEGAL CONSIDERATIONS

3.1 Consider these following situations:

a. A team has been assisting with the search effort for 36 hours. The subject is found, and the mission is terminated. There is no formal demobilization, everyone begins to disperse. On the way home, the driver of the team vehicle falls asleep, drives off the road, killing himself, 3 other team members, injures 4 others, and destroys the truck.

b. Same situation, but this time the driver crosses the center line, and a head-on collision results. A family of 5 is killed. Several team members are killed, several are injured, and the unit vehicle is totaled.

c. On the way home, the team stops at a 'road house' for a few beers. Later that evening, an accident occurs as a result of fatigue and alcohol. There is death and injury.

QUESTION: In these situations, where does the liability lie? Would formal demobilization make a difference?

RECOMMENDATION: Ensure that drivers leave base camp well rested. Offer all personnel a chance to sleep and eat. State in your demob plan that you will assume no liability should alcohol be consumed en route home.

Too often there is little or no planning for demobilization, or it comes too late. Things often are left to simply fizzle away. This can result in incomplete information, missing equipment, poor image of the agency in charge by the responders and many other problems, including legal.

DEMOBILIZATION CURVE
POST MISSION

OBJECTIVE: A student will be able to--

* Identify and discuss the objectives and techniques involved in meeting the post-mission search responsibilities.

* Conduct an effective post mission critique.

1.0 RESPONSIBILITY: One of the major responsibilities of a Search Manager is to provide for an effective critique of the entire search operation.

1.1 It is especially important to critique a suspended mission when the subject was not found.

1.2 As a minimum, your own self critique will help to review and improve your preplan.

2.0 WHAT IS A CRITIQUE?

2.1 A critique is a process intended to identify the lessons learned from an exercise or actual event.

2.2 A critique is not:

✓ A public session intended to lay blame on those who have made mistakes.

✓ A finger-pointing session.

✓ A vehicle intended to permit adversaries to embarrass each other.

3.0 CRITIQUE OBJECTIVE

3.1 A complete review of the mission from start to finish, conducted as soon after the mission is concluded, to determine:

a. WHY/HOW the search occurred?

b. HOW could it have been prevented?

c. ASSESS the effectiveness and efficiency of the entire search operation. What went well? What did not? Why or why not?

4.0 ELEMENTS OF THE CRITIQUE

4.1 Gathering of key mission personnel immediately after the exercise has ended.

4.2 Written comments on exercise suggesting corrections and improvements.
4.3 Analyze the corrections recommended:

✓ Decide which should be accepted.
✓ Make changes in the plan.
✓ Make changes in facility arrangements.

5.0 CRITIQUE CONSIDERATIONS

5.1 **Compile all necessary information** and statistics related to the mission. Consider the search planning maps, logs, lost person questionnaire, debriefing summaries, etc.

5.2 **Select a critique format** and organize your presentation.

a. Where will the critique be held?
b. Who should be there?
c. Should it be a Board of Inquiry? Are Heads/Administrators?
d. Consider using maps, slides, photos.

"A wise man learns by other men's mistakes - a fool by his own."

5.3 Critique **hints:**

a. Prepare a chronological listing or sequence of **Time** and **Events**.
b. Assess the **Positive** and the **Negative** on a step-by-step chronological basis.
c. Provide a mission report for everyone at the critique.
d. Submit an initial report to critique members, and have them read it and identify questions. Prepare a list of these questions in advance.
e. Record the critique proceedings.
f. **Examine the search plan.**
   
   - was the preplanning effective?
   - were the objectives appropriate?
   - was the organization effective?
   - did the strategy/tactics execution and procedure work?
   - did you have the right equipment and resources?
   - were there any special problem areas?
   - Were communications a problem?
   - Was the mission operation efficient?
   - Were the SOPs effective/complete?

  g. Review the investigation. Any criminal activity involved? If so, remember, all clues become evidence.
5.4 **Controlling** the oral critique:

a. Controller sets tone by saying what went right.

b. Limit number of people commenting.

c. Limit time allotted to speakers.

d. Control the person who didn't understand the exercise but likes his own voice.

e. Control the person who sees only negative side of things.

6.0 **CRITIQUE TECHNIQUES**

6.1 Be honest.

6.2 Seek improvements, not faults.

6.3 Send the results of the critique to interested parties.

"If one man calleth thee a donkey, pay him no mind. If two men calleth thee a donkey, get thee a saddle."

Remember, be honest, be open-minded. Truth, fact and reality from your perception are virtually meaningless. The perceptions of the other "players" (e.g., cooperating organizations, volunteers, the media, etc.) will dictate how they respond and behave during future missions. You must find out what their perceptions are.

7.0 **CRITIQUE FOLLOW-UP**

7.1 Revise your search plan as appropriate.

7.2 Have followup meetings with organizations, units, or agencies where improvements are needed.

7.3 Share information.

**NOTE:** Often all of these considerations are overlooked. As the Search Manager, your job is not over until the paperwork is finished.
8.0 POST MISSION TASKS

8.1 Final paperwork.
   a. Mission Report, include all information on the decision-making process as well as the results.
   b. Media Release, be sure to credit all the units involved.
   c. Appreciation letters.

8.2 Claims.
   a. Be sure to include proper documentation.
   b. Types of claims (usually only for volunteers):
      - injury.
      - property loss/damage.
      - expendable supplies.
      - "out-of-pocket" expenses.

8.3 Replace equipment.
   a. Immediately replace any used or damaged equipment so that you are ready for the next mission.

8.4 Critique.
   a. It should be a requirement that it is conducted as soon as possible after the mission.
   b. Could be integrated with the debriefing if team leaders will not be available for a critique. (puts more emphasis on a need for a well done debriefing).

8.5 Followup tasks.
   a. Determine what needs to be accomplished, assign jobs with a definite completion date.

8.6 Other?

"The trouble with man is twofold. He cannot learn truths that are too complicated. He forgets truths that are simple."
PSYCHOLOGICAL AND STRESS PROBLEMS IN SAR MANAGEMENT

OBJECTIVES: A student will be able to--

* Identify the specific contributing factors that lead to adverse psychological problems during search missions.

* Describe the causes of rapid on-set burnout and stress related inefficiency.

* Relate the basic guidelines for dealing with people in a crisis state.

* Identify a potentially hazardous situation known as a "critical incident", and the strategies necessary to counteract its affect.

"Blood and guts goes with the territory. If you can't take the heat, then get outta the kitchen!"

-Veteran Search Manager, who is also a F.A.!


1.0 **SAR MANAGEMENT PROBLEMS DURING MISSIONS WITH RAPID ONSET BURNOUT, STRESS AND REDUCED EFFICIENCY**

1.1 Contact with officials and mental health professionals in recent major search operations have highlighted the need for support of the emergency workers themselves with mental health crisis intervention techniques.

1.2 Anxiety, pressure to succeed and, physical exhaustion inevitably takes its toll, along with the added ingredients of emotional stress and potential trauma of dealing with family and friends of the missing or yet to be rescued subject(s).

1.3 It often becomes necessary for SAR personnel to wear many hats, so to speak, by engaging in numerous activities which transcend the specific areas of expertise and training for which they have been oriented.

1.4 The course of stress may vary from assisting with the removal and identification of the dead, to the effective handling of persons with depression and other stress symptoms stemming from loss of personal friends, loved ones or family.

   a. Regardless of occupation, multiple death situations are: -- unfamiliar -- distasteful -- not easily resolved.

   b. Encourage SAR personnel to ask for support and assistance, breaks, a change, avenues of tension release.

   c. In some instances, the pain of witnessing other’s pain may become intolerable as in the case of extreme grief over finding a small child dead.

   d. SAR personnel should be aware that witnessing certain events can generate emotions that could be difficult to handle if it brings back or renews past grief reactions.

   e. The phenomenon of "death overload" is very possible in multiple casualty situations. Personnel can become so overwhelmed by the quality and quantity of death that the person’s psycho-social ability to cope with reality breaks down.

      - people staring at a victim’s body.
      - turning away in horror.
1.5 Doubts begin to emerge as to whether or not a situation may have been or is being handled properly or in a timely manner.

1.6 Everyone needs to have a scheduled break from crisis activities.

   a. Scheduled breaks with suitable back-up forces should be part of the planned response to any major search and rescue effort.

   b. No more than two (2) hours under any circumstances, in the blood and gore. (rescue, plane crash, etc.) **Never subject young SAR personnel to situations of this nature!**

   c. Many times just a few hours break will suffice. In more drastic cases, it may be necessary to schedule a complete day. (as in the case of search on Mt. St. Helens)

   d. **SEEK SOME PROFESSIONAL ADVICE ON THIS SUBJECT AHEAD OF TIME!**

1.7 SAR personnel in all aspects of mission response have a tendency to expose themselves to unprecedented personal demands in their desire to help meet the needs of the missing subject or yet to be rescued victim.

   a. Many personnel, especially some volunteers devote all of their time and working effort to the mission created tasks.

   b. In some cases, as the mission winds down and the subject has not been found, some of the personnel, especially the volunteers, return to their regular jobs and at the same time attempt to continue devoting time and effort to helping with a mission. This is often the result when back up and support resources are not planned for and individuals are called upon to work for extended periods. (several days at a time)

   c. The result of the overwork is the rapid onset burnout syndrome --- in essence, a state of exhaustion, irritability, and fatigue which markedly decreases effectiveness and capability.

   d. Managers at all levels should be alert to causes, signs and symptoms.
1.8 Four categories of symptoms have been identified to help recognize adverse reactions:

a. **Ability to think:** Mental confusion, slowness of thought, inability to make judgements and decisions, loss of ability to conceptualize alternatives or to prioritize tasks, loss of objectivity in evaluating own functioning, etc.

b. **Psychological moods:** Depression, irritability, anxiety, hyperexcitability, excessive rage reactions, etc.

c. **Somatic or physical characteristics:** Physical exhaustion, loss of energy, gastrointestinal distress, appetite disturbances, hypochondria, sleep disorder, tremors, etc.

d. **Behavioral:** Hyperactivity, excessive fatigue, inability to express self verbally or in writing, etc.

1.9 What should be done?

a. Talk to the individual and try to get them to recognize the symptoms in themselves.

b. Relieve the person from his or her duties for a short time initially.

c. Relieve any guilt by giving official permission and point out loss of effectiveness in doing the job if the person remains on station.

d. Try to persuade the worker to take time off, then order it.
1.10 How can the problems be prevented?

a. It is useful ahead of time to provide any SAR personnel with a clear understanding of what may be expected, so that personal recognition of one's limitations and shortcomings can be placed in proper perspective.

b. It should be emphasized that every human being has his or her limit and it is appropriate and healthy to recognize this fact when the time comes.

c. Heroic actions must be realistic. The responder would be ill advised to expect himself, or herself to act in super-human ways in expenditure of energy in any dimension: mentally, physically, or emotionally.

d. Recognition of these facts is an absolute necessity to prevent becoming a self imposed victim of the "rapid onset burnout" phenomenon. They should be discussed openly with all other facets of crisis intervention and mental stress.
ONE ON ONE WITH A YET TO BE RESCUED OR MISSING SUBJECT'S FAMILY AND FRIENDS

2.0 BASIC CONCEPTS INVOLVED IN CRISIS INTERVENTION

2.1 Crisis is a state of being: It is a condition that a person may be in as a result of exposure to a long and difficult search mission in which a family member, close friend or associate is lost or is in the process of being rescued.

- It is also a state of emotional turmoil that can be a turning point to good or bad.

- It is a serious interruption in the steady state or equilibrium of a person.

Normal Steady State

Thinking  Feeling (emotions)

Crisis State

Thinking  Feeling (emotions)
2.2 The crisis state is characterized by the inability of a person to cope with stress.

a. Immobility and helplessness are two good indicators.

b. Examples: "I can't believe this is happening!"
   "I know it's important, but I can't seem to remember. My mind is a blank!"
   "Just leave me alone and go find Billy!"

2.3 A crisis state is self-limiting and does not continue indefinitely.

a. In general the crisis state will normally only last 24 to 36 hours.

b. Most people will internalize the event into their lives and resume coping without further need for support.

c. It is very real and in some cases overwhelming to the person experiencing it.

3.0 IMPORTANT POINTS TO REMEMBER ABOUT DEALING WITH PEOPLE IN A CRISIS STATE.

3.1 A crisis state is different to each person.

a. The tendency of emergency response workers may be to prioritize and place judgements on how other people may be affected.

b. It is important to realize that this crisis is truly that individuals perception of his or her status. (or the missing person's status)

c. What happened on other missions doesn't significantly affect the personal experience of what is now happening.
3.2 The responder needs to **relate to friends and family** on the level that those people feel is important.

a. SAR personnel must try, if at all possible, to convey a sense of importance and urgency to family and friend's concerns or problems. As a responder, there are obviously some priorities that must be set, but don't expect these people to understand that necessity.

b. At least imply to them that you think their problem is important without being patronizing.

3.3 Persons who experience the crisis state for the second time will be better able to cope. It will not necessarily be the "crisis" that it was the first time.

a. The "Outward Bound" program for executives was built around this adaptive behavior.

b. As individuals experience crisis states, they also build coping mechanisms which reduce the impact when experiencing a similar situation again.

3.4 Some symptoms that will better help you understand the reactions you are seeing:

a. A loss of security or threat to basic needs or integrity is often times met with anxiety.

b. A deprivation, (loss of a loved one, food, basic emergency and life safety needs) is often met with depression.

c. The anxiety reaction to the threat of loss can turn into depression when the loss actually occurs.

3.5 Crisis is self limiting as a state.

a. For those who experience adverse reactions, intervention can be a most important factor in re-establishment of normalcy.

b. Sometimes, just matching needs with helping people may be enough to limit frustration and work out emotional problems.
4.0 **CRISIS INTERVENTION -- CAN YOU HELP?**

4.1 Crisis intervention is a mental health procedure very much like first aid. Nearly everyone can perform enough to be helpful and in some cases, it will make later treatment unnecessary.

4.2 Often, nothing more than relating feelings and/or personal experiences is one of the best treatments for victims who have just been rescued. (and their family and friends also)

   a. Getting it out, going over the details again with understanding sympathetic ears is helpful.

   b. Encourage families to discuss with others what has happened to them and to share their fears, anger, emotions, etc.

4.3 Do not be put off or offended when individuals direct blame toward response agencies and persons who are perceived as authority.

   a. Blame assignment is a phase of the crisis state that many people will go through, and can best be dealt with by patience and calm reasoning.

   b. Other attitudes that can be even more difficult to deal with are ideas that the victim is being punished by God for sins and defects in their character. If someone can't convince them that this is not the case by sharing and listening, then refer them to professional help.

4.4 Use the educational approach to the problem if possible. Persons in a crisis state tend to have tunnel vision and can't see alternatives.

   a. Give them some alternatives that have been effective for other people.

   b. Match them up with counseling/mental health resources and offer suggestions for resolving anxieties.

4.5 Persons who have suffered a traumatic situation that precipitated a crisis state are more susceptible to persuasion than almost any other time in their life. They can sometimes be literally led by the hand.

   a. Don't make all the decisions for the person as it may only be a band aid that won't suit their life at all.

   b. It may even increase the trauma and prolong problems. Give alternatives and then let them make the decisions.

   c. Make every effort to keep your value judgements from personal life out of the situation.
4.6 A very limited number of people in a crisis state have had their defenses entirely destroyed. Some will literally go back to a very elementary state.

Example: "I just want to go home!"
"Why him?, He didn't do anything!"
"I can't take this, it isn't fair!"

5.0 GENERALIZED COUNSELING POINTS FOR RESPONDERS

5.1 Know yourself: To deal effectively with people in crisis, it helps to know yourself so that you're not threatened by other peoples problems. It is of the utmost importance when applying emotional first aid that you do not bring judgements, biases and prejudices into play. That would be like a doctor giving someone a disease while treating a cut. Try to understand where they are by entering into the feelings of that person. Don't be afraid to respond to their feelings within reason, as long as you keep your perspective. Shared feelings can help the person as well as the SAR worker to cope with the problems at hand.

5.2 Purposeful Expression of Feelings: Encourage purposeful expression of feeling as it relieves tension and frees the person for positive constructive action. If you let someone express themselves, you will undoubtedly learn more about the problems and the person.

LISTENING IS A FORM OF PSYCHOLOGICAL SUPPORT
DO IT!
5.3 Feel without becoming part of the problem. Know your reasons for involvement, but don’t be afraid to respond spontaneously. You are human to, and as a responder, you may be suffering from much of the same emotional overload as the people you are dealing with.

5.4 Perceive and deal with friends, family and associates as they really are while maintaining their sense of dignity and sense of worth in the search effort.

5.5 Beware of the need to control other people in yourself. Also look for it in other SAR workers who are trying to help other people as well. It is a self-made ego trip for people who need to control. Crisis impacted people are very susceptible to that kind of control, and it could be very damaging to the person in the long run.

5.6 In the final analysis, you must encourage and let people make their own choices. You are the first aid, and you have the support and resources to offer.

**POST TRAUMATIC SHOCK/STRESS**

6.0 POST TRAUMATIC SHOCK IS OFTEN THE RESULT OF WHAT IS CALLED A "CRITICAL INCIDENT"

6.1 A critical incident doesn’t have to be big, it just overwhelms an individual’s emotional resources.

   a. **Anxiety** is the sort of thing we all suffer through on a daily basis. It can result from a phone call from the boss, speaking in front of a group, or waiting for the results of a test. It is directed at a specific cause that is readily identifiable.

   b. **Anxiety Reaction** is the development of physical reactions to a particular stress anxiety. The cause is not always readily identifiable and can manifest itself in everything from minor headaches to the symptoms of cancer.

6.2 These reactions along with "rapid onset burnout" can indeed be serious, but under the severity of the Search and/or Rescue environment, treatment or counseling may not be possible. The only alternative may be to encourage individuals to talk about their feelings during a group or individual conversation.

6.3 **Traumatic Stress or Post Traumatic Shock** however, is a different matter. This psychological problem must be dealt with by a professional in the mental health services area.
6.4 Post Traumatic Shock is caused by a significant emotional trauma such as exposure to gruesome death, mutilation of children, and/or causing someone to die or suffer.

a. Examples: Post Vietnam syndrome.
   The death of a fellow search worker.
   Post shooting trauma.
   Kansas City Hyatt Regency collapse.
   San Diego PSA crash.
   Loss of life after a long successful rescue.
   A long grueling mission with heavy emotion and physical strain.
   Death of a child or other relative.

6.5 The problem can manifest itself in victims as well as responders. It is a complex problem that can be specifically directed or free flowing at something general.

6.6 **Symptoms include:**
   - vivid uncontrollable flashbacks.
   - physical dysfunction.
   - nightmares and sleeping problems.
   - deterioration of physical appearance and health.
   - deterioration of personal and family relationships.

6.7 There seems to always be depression involved. In the case of some victims, this seems to affect their ability to perceive anything pertaining to help as not needed and irrelevant.

a. Some of these cases cannot cope with any type of aid system that might be set up for responders or victims.

b. They simply try to retreat into a hole and pull it in after themselves.

6.8 In the case of first responders, or other search personnel, the age old macho image may bring about conflicts of feelings that result in depression or physical dysfunction.

a. "older more experienced veterans aren't supposed to be bothered by that type of thing!"

b. "We've seen it all!" "If you can't take the heat, get out of the kitchen!"

c. And yet they are bothered and don't really know how to cope with it. That's why professional help is needed in these cases.
6.9 It is bad enough when the stress is caused by the search or rescue, but there are a lot of traumatic stress sufferers barely coping in the everyday world.

a. A traumatic event provides the overload that is beyond their abilities to cope.

b. Very often their problems will result in anger and criticism directed toward perceived authority.

c. In some cases, this could be responders and/or other search personnel.

6.10 If the situation involves the death of many and only one or a numbered few survived, something called survivor guilt can be present. Some will be convinced that they were the cause of the situation or death.

6.11 Only recently have these kinds of problems been identified and programs designed to meet the needs of these demands.
7.0 STRESS DEBRIEFINGS AS AN INTERVENTION TECHNIQUE IN "CRITICAL INCIDENTS"

7.1 According to Jeffrey T. Mitchell, University of Maryland, Baltimore County, "Critical incidents are any situations faced by emergency workers that create unusual or acute emotional reactions that interfere with their ability to function either at the scene or later." Lessons learned from recent case histories have repeatedly pointed out that all rescuers and emergency workers are very vulnerable to adverse psychological reactions.

a. A recent innovation being developed by Dr. Mitchell and his colleagues in the Emergency Health Services Program at the University of Maryland, Baltimore County, is a crisis intervention program designed to assist these emergency workers. It is an effort to reduce the number of psychological casualties in this professional group.

b. Among all the many methods of treating stress response syndrome, the most successful, especially that being suffered by emergency personnel, is the CRITICAL INCIDENT STRESS DEBRIEFING.

- This is an organized approach to dealing with individuals who have experienced a critical incident.

- The process basically has three parts and involves a mental health professional.

1) ventilation of feelings and an assessment by a facilitator.

2) discussion of the signs and symptoms of stress response.

3) closure, including resource identification, plan of action and referrals.

Current studies indicate that the length of time between the incident and the "Critical Incident Stress Debriefing" directly affects the success of the stress intervention technique. The longer the time between the two, the less effective the process will be.
7.2 Ideally, the intervention should take place within 24 to 48 hours.

   a. after about six weeks, this technique is considered to be at
      minimal effectiveness.

   b. chances of lifelong emotional problems, or reproccusions is great
      after a six to eight week period.

7.3 Mitchell, University of Maryland, Baltimore County cites four types
of Critical Incident Stress Debriefings. Although each is focused on
separate goals and procedures, the end product is essentially the
same: Reducing psychological casualties, (i.e. lost time, ineffectiveness
at work or family problems) in emergency workers. The first two are considered informal and may be conducted by a non
professional health service worker.

   a. The on-scene or near scene debriefing: As stated, this debriefing
takes place at or near the incident site and is the shortest of the
intervention processes. A facilitator spends time with those
on-scene who appear to need a break or change of duties.
Primary function here is to listen. A rapport must have been
built between any facilitator and the responders before the
incident for this type of process to really work well.

   b. The initial defusing: This debriefing, or more accurately free
flowing discussion, can be led by a mental health professional or
more often a management level officer from the emergency
service or volunteer group. This process should be held as soon
after the incident as possible, and it has been suggested that
even though individuals may not interact or talk, everyones
attendance be mandatory.

   c. The formal incident debriefing: This should be led by a formal
professional mental health specialist from 24 to 48 hours after
the incident. Once again, this session should be mandatory and
usually consists of six phases:

      1. Introductory phase: Meeting is confidential, mandatory to
         attend but not to participate. Rules of the process are
         explained and everyone agrees to be silent about the meeting
details.

      2. Fact phase: Facilitator must know enough about the incident
to avoid surprise.
         - recreates the scene.
         - participants relate sights, sounds, smells, what they
           heard and what they did.
         - sometimes films, radio tapes, videos, photos and
           diagrams are used.
         - incident comes to life again.
3. **Feeling phase:** Here, participants ventilate their feelings and no one criticizes anyone else.

   - How did you feel?
   - How do you feel now?
   - Have you ever experienced anything like this before?

4. **Symptom phase:** Participants relate the unusual feelings or occurrences that each experienced, both at the scene and after.

   - 1 to 3 hours later.
   - How about now?

5. **Teaching phase:** Everyone is briefed and oriented to normal response to "critical incidents."

   - "It's normal to feel that way!"

6. **Re-entry phase:** Facilitators outline a formal plan of action to get back into normal and routine feelings.

d. **The follow-up incident debriefing:** This process is usually held weeks or months after and may or may not be necessary. This is by far the most difficult debriefing and may require several sessions to relieve the individuals totally from the psychological and physical reactions.

7.4 **Many people in emergency response, and even at management levels, pack around excess baggage that should have been debriefed at the time of the incident.**

Managers and supervisors need to be much more cognizant of the "Critical Incident" stress response syndrome, and do better at facilitating intervention techniques. The Search and Rescue professionals deserve better than they have been getting.
LEGAL ISSUES: SOME THOUGHTS AND COMMENT

OBJECTIVE: Each student will be able to--

※ Discuss the basic issues of liability in SAR response.
※ Relate the essential elements that must be proved in order to show liability.
※ List the most common causes of lawsuits against emergency responders.

<table>
<thead>
<tr>
<th>Bad News:</th>
<th>Lots of litigation is being attempted (Count On It!).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Better News:</td>
<td>Only a few attempts get to court.</td>
</tr>
<tr>
<td>Good News:</td>
<td>To date, most plaintiffs do not win</td>
</tr>
</tbody>
</table>

1.0 BASIC QUESTION: "Can a government agency (sheriff's office, National Park, etc.) be held liable for injury or death caused (or made likely) by its failure to eliminate/reduce known SAR hazards and/or its failure to respond to SAR incidents quickly and efficiently?"

1.1 "Can a non-paid SAR organization be held liable by its failure to respond quickly, efficiently, and deliver an adequate "standard of care"?"

The public and courts expect professionals (whether paid or not) to use the highest standards.
2.0 LEGAL FACTS OF LIFE

2.1 The SAR response network is a "deep pocket".

2.2 Reoccurring SAR response mistakes are documented by researchers.

2.3 SAR incidents in all environments have increased, and usually gain immediate media attention.

2.4 Government's sphere of influence has been increasing.

2.5 The numbers of lawyers has increased.

2.6 The "act of God" is disappearing as a defense.

2.7 The media and general public have become more aware of government's role(s) in SAR, and are expecting results.

- There is an implied guarantee that government "knows what it is doing".

2.8 Non-paid (volunteer) SAR organizations often act as agents for the responsible government agency.

2.9 Individuals can incur personal liability for improper actions.

3.0 UNDERSTANDING THE LAW AND THE PROCESS

3.1 The right to have SAR brings a duty to SAR.

✓ duty of a responsible agency to be contactable by phone and radio.
✓ duty to perform a timely response.
✓ duty to adequately respond when needed.
✓ duty to do what is "reasonable" in specific situations.

NOTE: Reasonableness is determined by circumstances:

- foreseeability of injury.
- cost/benefit versus inaction.

Both may be determined after injury and death have accrued.
3.2 Civil suits are private legal actions brought to court by plaintiff(s) who believe they have been harmed by the person being sued (defendant).

- **Goal of civil suit:** monetary compensation for the harm.

3.3 The plaintiff has the burden of proof and must prove that:

**FAULT = CAUSED = DAMAGE**

3.4 A plaintiff's lawyer will have to show:

- **A duty** to the plaintiff.
- **A standard of care.**
- **Violation** of that standard of care.
- **Foreseeability of injury/damage/destruction.**
- **Injury/harm proximately caused by violation of established standard of care.**

3.5 **Types of Fault** (Degrees of Negligence)

- **Slight Negligence:** a failure to act perfectly, or just being human.

- **Negligence:** commission of some wrong act or omission of some correct act, which would not have been done or omitted by a reasonably prudent person in the position of the wrongdoer.

- **Gross Negligence:** a great departure from proper standards of care.

- **Bad Intent:** conduct which is malicious, willful, wanton.

3.6 Remember, you don't get a jury of your peers, you get a jury of "folks". They will investigate your prior experience, knowledge, and why you didn't know of new methods, techniques.

3.7 **Questions:**

- Was there a duty?
- In the process, did you injure the victim?
- Were there improper techniques?
- Did you act in good faith?
- Were you working for the victim?
- Were the victim's best interests always the goal?
- Did you do all that you could reasonably do? And, did you document it?
4.0 HOW AND WHY LAWSUITS OCCUR

4.1 Negligence in the . . .

⇒ Selection (use the right people!)
⇒ Training (do it!)
⇒ Supervision (you must provide direction!)
⇒ Retention (you must get rid of people who can’t do the job!)

. . . . of emergency workers (either paid or non-paid!) All can cause liability.

4.2 Government officials, responders "may be" free from liability if:

1. There was no malice.
2. They were acting in their official capacity.
3. They were acting within their scope of authority.
4. They were acting reasonably and prudently.

DON'T ARRIVE ON SCENE UNABLE TO THINK, ACT OR PERFORM EFFECTIVELY.

5.0 SOME THOUGHTS ABOUT THE USE OF NON-PAID (VOLUNTEERS) RESPONDERS.

NOTE: Most non-paid SAR units are highly trained and organized, but from a local government or land management agency viewpoint, consider the following:

5.1 Some control will be lost by delegation of responsibility to non-paid (volunteer) groups.

5.2 Good, experienced leadership could be lacking within the non-paid (volunteer) unit.

5.3 Response time by non-paid (volunteer) groups may not be adequate.

5.4 Who provides the liability coverage when non-paid (volunteer) groups are used? What happens if the responders are injured or killed?
6.0 **THE BOTTOM LINE:**

6.1 You (officials, responders) are charged with responsibility to respond "reasonably and effectively". The difference between "proper response" and "sloppy response" relates to preplanning and response development.

6.2 Prevent future legal problems by:

✔ Developing **your own "standard of care"** through planning and training:

✔ Consider shortages of time, space, equipment, supplies, manpower that are inherent in emergencies.

7.0 **WHAT ABOUT "GOOD SAMARITAN" LAWS?**

7.1 It is generally held that SAR persons lose this protection when they volunteer their time and efforts as part of a "planned response" under the "color of the law" such as an official SAR mission.

7.2 By volunteering to go to the scene of an emergency, SAR persons assume a legal duty to give the victim reasonable care and not to increase the risk of harm or cause further harm which leaves the victim worse off than he/she was before receiving any care. If the SAR person breaches that duty, he/she can be held personally liable for civil damages.
NOTES:

RESCUE AID

- QUALIFIED? -
SAR STATISTICS

OBJECTIVES: A student will be able to--

* Describe the importance of maintaining a local SAR mission data base.
* Discuss the benefits of SAR statistics.

ANOTHER FORM??!! WHO NEEDS IT??!!

By: Stan Bush

*How much money is being spent on Search and Rescue annually?
*How many Search and Rescue missions are there each year?
*Who is the typical SAR subject? Is it the 14 year old boy or the 54 year old hunter?
*Why are they getting into trouble? How can we prevent it?
*When a person does get lost, what does he do? How far does he go? Where can we find him?

The people in Search and Rescue have always been interested in developing new tools and techniques which might help them do their jobs better toward the common goal of saving lives. This has promoted research in everything from hypothermia to belay plates in an effort to raise the "State of the Art" in SAR. As an integral part of this effort, a number of people have been doing research in areas which require gathering and comparing a cross-section of Search and Rescue data. The potential value of this research has been graphically illustrated in the works of individuals as Dennis Kelley, Jon Wartes and Bill Syrotuck. Their work shows beautifully what can be done by gathering the right information, but a common problem keeps hindering the effort: How to collect the information on a large enough scale to make the results representative for the entire SAR community. In addition to this is the problem of being able to compare the data once you have collected it.

Most of the teams involved in the various aspects of Search and Rescue have recognized the desirability of keeping some sort of record of their mission involvement. With few exceptions, however, this record is intended for the use of the specific team and therefore concentrates on gathering items of local interest and keeping historical narrative of the mission for future reference or posterity. For this reason each team has its own report form and consequently no two forms are alike. If we then consider the fact that each person seems to fill out the form differently, it makes it almost impossible to gather and compare the information collected on a regional or national scale.
In 1975 NASAR asked Bob Mattson to chair a committee for the specific purpose of designing a SAR Data Collection System which would serve the needs of various organizations from local teams to researchers. At first glance the task seemed relatively simple: if we could get a large, broad based sampling of the mission report forms that groups were currently using, we could select the 20-30 items of information most commonly requested and consolidate those into one form that could be used by all groups. The word went out, the sample forms came in and the problems began.

Much to our surprise there was no consensus. Each form seemed completely different, not only in the obvious areas such as appearance and format but more importantly in specific areas of information requested. In fact the only piece of information common to all of the forms was the date, and even then it was not clear whether they wanted the date of the mission or the date the form was being filled out. Obviously we needed to approach it from a different angle.

A series of conversations with people in the field of data collection all echoed the same dictums:

* Determine what you are going to do with each item of information before you decide to collect it.

* You can’t properly design the collection system (the form) until you know what questions you want answered.

* In short, "What is the purpose of the data?"

With these principles in mind, we decided to make up a questionnaire designed to ask knowledgeable SAR people which items of information they felt would be the most useful to the overall Search and Rescue effort. The four page questionnaire was distributed in the fall of 1976 to over 100 persons which finally resulted in 66 responses which were tabulated to finally yield the consensus of the participants which were hopefully representative of the SAR community.

From the questionnaire many specific items of information were identified as "useful" and some as "essential" but more importantly, five major areas of interest seemed to emerge:

1. **Magnitude of the SAR problem.** This is data which would provide information for budgeting, funding, legislative program assistance and grants. It could help define "the shadow of the elephant" and be tremendously useful in soliciting support whether it is from the local county commissioners or all the way to the state and national levels. It's difficult to convince someone to give you help without first convincing him that you have a problem. Specifically we need answers to such questions as: How many SAR incidents are there annually? How much time is involved (manhours)? How much money is being spent and on what items? How many resources are being used (manpower and equipment)? If we can get a better handle on these unknown quantities we will have a better grasp of Search and Rescue across the nation.
2. **Preventative Education (PSAR).** The PSAR people are working hard to try and put the rest of Search and Rescue out of business. We can save ourselves and, more importantly, the "potential" subject a lot of trouble if we can prevent the SAR situation from happening in the first place. But just who is this "potential" subject? Is it the 14 year old boy or the 54 year old hunter? Why are they getting into trouble? How can we prevent it? A lot of excellent work is being done in this field but we could contribute to this effort tremendously if we knew more specifically where we should direct our PSAR efforts and what those efforts should consist of.

3. **Subject Behavior.** If, in spite of our PSAR efforts, the subject does get lost, what does he do? Which way does he go? How fast does he travel? How far does he go? In short, where can we find him? Until his death, Bill Syrotuck led the way in demonstrating the value of using historical subject behavior as a tool in search planning. Through statistical analysis of actual case histories, he worked towards defining high probability areas for the location of the victim. His work is being continued by others who urgently need more reports from various parts of the country in order to obtain a broader database. By accurately and faithfully recording the necessary information we have an opportunity to contribute to what might potentially be the best crystal ball the Search Manager will ever have.

4. **Preplanning.** This is one of the most essential aspects of any well organized Search and Rescue team. A preplan can improve the effectiveness of a team by making certain critical decisions in advance of the actual mission, thus conserving time, effort and resources toward a more efficient operation. Where are the problems occurring? This means on a state and national level as well as either in our own county or area of operation. It could help us recognize and possibly reduce certain objective hazards. It could also help us determine what types of resources we need and where they should be located or be able to quickly respond with the right equipment. We can find out if our alerting procedure is effective as well as how long it takes us to be notified and respond after the incident occurs. What types of missions are we having and could special training in these areas increase our effectiveness? Do we need to direct our medical training toward any specific injuries or problems that seem to be more prevalent? Do we need to obtain certain items of equipment or develop specific skills? What we want to know is: "How can we do our jobs better?"

5. **Historical Record.** After the mission is over and the dust has settled we need to retain some kind of record of the entire operation. It provides a historical perspective for the local group and forms a possible basis of comparison for new SAR methods and techniques. Certain items of information are valuable during a mission critique and for future reference if questions happen to arise. With the increasing emphasis on legal suits it is obvious that no single form can hope to record all of the necessary information that should be kept in the local team's file on each mission, including interrogation notes, team assignments, strategy maps, radio logs, newspaper clippings, etc. The form can, however, provide a clear, accurate and concise synopsis of the mission for future reference and review.
NOTES:

--- THE GENERAL PICTURE ---

WHAT IS THE TOTAL DEMAND FOR SAR RESPONSE?

100,000 Plus SAR missions per year in U.S.

?
The Most Successful Search And Rescue Mission Is The One That Never Had To Happen!
by Patrick LaValla

"Our average victim travels too far, too fast... ignores signs of weather change and environmental hazards... ignores body indicators... and has not learned to protect and conserve what he has."

In an effort to save lives through education, the Washington State Department of Emergency Services, Search and Rescue (SAR) Division, has been recording data and statistics to find out what factors were present in each SAR mission that may have caused a problem to develop. The following list is an initial attempt to create a preventive search and rescue (FSAR) victim profile. Hopefully, education efforts targeting in on these factors can help to prevent future SAR missions.

Hazards contributing to survival danger:
1. Improper clothing and/or foot gear.
2. Lack of rest (fatigue).
3. Thirst (hypohydration).
4. Hypothermia or Hyperthermia (body temperature management).
5. Too ambitious an undertaking for current skill proficiency.
6. Poor physical condition and/or lack of motivation.
7. Inadequate or improper food.
8. Little or no planning.
9. Inadequate party for goal; lack of leadership.
10. Itinerary not known to others.
11. Could not recognize a potential problem and threat physically, mentally, or environmentally.
12. Weather (no preplanning).
14. Had not anticipated a problem (it can't happen to me!).

One or more of these factors usually caused a problem to happen.

We have also concluded that our average SAR victim is a composite outdoorsman — i.e., hunter, fisherman, skier, hiker, camper, boater, climber etc. He usually does not do any of these well and is not a member of related organizations. He resides in densely populated areas, travels far for seasonal recreation, has time and money, and puts too much faith in material goods and mechanical devices.

Our average victim travels too far and too fast to acclimatize; ignores signs of weather change and environmental hazards; ignores body indicators in quest of preset goals; travels from artificial environments not prepared to sustain life; and he has not learned to protect and conserve what he has.

Our modern outdoor adventurers attempt to emulate the pioneers. Unlike modern man, the pioneers daily existence depended upon coping with weather, terrain, natural hazards, and they had no time schedule. Today's "weekend pioneer" has a crowded time schedule and due to economic dependence to his job, often makes bad decisions in order to be back for work on Monday morning.

(Continued...)

DON'T BE A SHEEP

* EVEN PEOPLE CAN BE LEAD TO THEIR DEATHS

EACH INDIVIDUAL MUST:
1. Know own abilities and limitations
2. Make the leader aware when:
   a. You are approaching your physical limits
   b. When you will be beyond your safe ability
MOST SUCCESSFUL SAR
(Continued . . .)

Most wilderness emergencies are usually solved either by the victim or outside help within 72 hours. The decisions and actions taken by the victim during the first 6 hours were the most critical, influencing the outcome.

Weather was a major factor leading to misery causing carelessness which lead to an accident.

The following PSAR curriculum outline is based upon this victim profile analysis as an example of how programs and presentations can be structured.

RATIONALE

In an analysis of what is needed by land management and the recreation participant, we learned that common sense and PSAR knowledge could, if used by all, alleviate the major problems. But it doesn’t seem practical to try to teach common sense — you have it or you don’t. So we looked further. We analyzed outdoorsmen who, we felt, had common sense (people accepted by land management as good outdoorsmen, experienced, reliable, and protective of the lands they travel). After much research we found that people with outdoor common sense have certain things in common:

- They understand the priorities of life and survival.
- They can recognize and analyze body problem indicators.
- They can recognize a danger problem developing.
- They are curious, inquisitive, alert, confident, and search for information.
- They can apply sound judgment to time and environmental problems.
- They are decisive after analysis of the problem or threat.
- They enjoy a mental or physical challenge.
- All are seemingly non-destructive of material things; most are do-it-yourselfers, and work well alone.

When we look at this list of basic human attributes, we find that many of these qualities are absent in those people adjudged to be the problem makers for outdoor recreation land managers. Furthermore, we found that those experienced outdoorsmen we analyzed had to acquire extra knowledge in five categories, either by reading, practicing, or taking courses. These are the categories of knowledge which can be taught to bolster self-confidence in providing for and protecting life away from civilization.

1. Self First Aid — Knowledge of immediate first aid to self and others.
2. Survival Knowledge — How to protect and provide the necessities of life long enough to get back home.
3. Navigation — Knowledge of how to determine one’s exact position on earth in relation to home, car or civilization.
4. Hiking — They learned, practiced and perfected good techniques of eating, sleeping, and traveling in all terrain and amid all environments.

5. Recreation Sports — They acquired specific knowledge, practiced safe techniques in the use of special recreation-related equipment, i.e., skis, snowshoes, ice axes, ropes, guns, vehicles, etc.

If good outdoorsmen admittedly acquired these five kinds of knowledge at their own expense of time and energy to become better prepared, then these should become the basis for an educational effort to thwart the necessity for excessive, restrictive regulations.

Now that we know what education is needed, let’s determine who needs it. We must recognize that we have three different groups of recreation travelers. Each group requires a different type of program to provide them with the basic information they need. These are:

- Today’s Traveler — He’s Gone.
- Tomorrow’s Traveler — He’s Planning To Go.
- The Future Traveler — He’s Hoping They Will Let Him Go.

Today’s Traveler has left for the field. We are too late to reach him with education. Any educational help he gets will be from the land agency he visits — via signs, literature, and verbal contacts.

Tomorrow’s Traveler may or may not take time to read, plan and prepare for his trip. The best effort here will be visual aids, literature, books, lectures, and specific adult courses that teach recreationists the basics of eating, sleeping, and traveling away from our society’s modern technology.

The Future Traveler can be reached via the regular learning channels, providing all of the schools offer good basic education at the receptive age. The basic subjects necessary for travel away from civilization are also useful every day by every person within civilization. The difference is that modern technology makes it easier.

(Continued . . .)
MOST SUCCESSFUL SAR
(Continued . . .)

Everyone must learn or depend upon someone to provide the simple first aid, survival, and navigation needed just to live and travel in our modern society. It would be extremely helpful in daily life if these basic subjects were taught to all rather than leaving them to the trial and error learning method used now. If all respectable outdoor oriented organizations would agree on the educational subjects needed, their priority of importance, and would support the program within the school system, it will be possible to save lives through education.

A LITTLE PHILOSOPHY . . .
Who Needs Survival Education?
EVERYONE who is dependent upon someone else to provide his needs; who purchases supplies from others; who depends upon a service industry for his energy fuels for operation. EVERYONE who does not have acreage on which to grow his food, and a river, lake, creek, spring, or well to provide water to slake his thirst and maintain his body. ANYONE who does not have insulation to shelter his body. ANYONE who does not know the basic requirements of life. Do you think you could survive a week without modern technology?

Everyone should be constantly aware that unexpected emergencies do happen and that they may threaten life anywhere, anytime. Today's modern generation should be aware that our civil government and its supporting service industry is not infallible. Natural disasters, man-made disasters, and man himself can alter the local service industry or render it incapable of providing a particular needed service. The inhabitants might then be left to the mercy of their own thinking, foraging, and ability to provide their own necessities. Only through experience and education can our people learn the basic rules their forefathers lived by, but which have been overlooked in our pursuit of progress.

A distress situation can happen anywhere, from the beaches to the mountain top, and all areas in between. The distress may or may not have been caused by lack of equipment or the lack of safety techniques. More likely the distress was the result of a combination of human error and environmental hazards, with the prevailing weather contributing in some way.

Emergency Time Lag — No matter what the emergency situation, there will always be a time period during which the individuals involved will have to fend for themselves. The location and severity of the emergency will determine whether the wait is in minutes, hours, or days.

It takes time to organize and provide help. Until government and volunteer units can organize to bring help, individuals are on their own. Many people survive the actual emergency but not the hours or days while waiting for help to arrive.

The victim of a wilderness emergency need only wait for help to arrive, provided, of course, that a responsible individual or agency has been informed of his proposed whereabouts and trip plan. Telling a ranger or official of the forest service destinations and proposed return times is a good practice if entering public lands. Failure to return usually results in a check and may precipitate a search. At the very least, one should give a friend or relative pertinent facts of a proposed trip, i.e., destination, return times, etc. Always be sure to check in so that rescuers are not sent out on a false alarm while supposed victims are home safe.

Survival is staying alive — keeping the body alive. Survival is a word that is applied to any situation which may cause problems or (Continued . . .)
A BREEZE IS A JOY IN SUMMER.

A BREEZE IS A KILLER IN WINTER.

MOST SUCCESSFUL SAR
(Continued . . .)

threats against the body which the survivor has to overcome himself — either alone or as part of a group.

Survival is the challenge to stay alive. Since you have survived long enough to read this, you should have acquired some knowledge about staying alive. How much depends upon your curiosity, habits, environment, and input of knowledge. Hence you may or may not have the awareness knowledge necessary to survive a short-term threat upon your life.

Surviving the unexpected emergencies that threaten life is your problem — a problem that, in essence, is yours alone, because unexpected survival problems cannot be planned — they happen. So you must face the problem with just what you have, where you are — possibly with the outcome resting solely on your decisions. No one has to assist you. No one has to find you. No one really has to provide your basic necessities. Even if there are rescuers and agencies nearby who will attempt to help you, you must stay alive long enough for them to get to you.

Since you must be master of your destiny, surviving any unexpected emergency becomes your problem to solve. Problem solving can be easier if you know what the problem is, how it threatens your life, and how to improvise a defense against that threat.

Modern technology has accustomed citizens to light switch conveniences that have eliminated problems of heat, cold, thirst, hunger, fear. In this age of specialization, people depend on others for nearly all needs. They receive money for services and exchange it for shelter, clothing, water, transportation, food and electricity. In an emergency situation, many people are helpless to provide their own basic needs. Pioneers understood the land and navigated by the stars. They understood and respected the forces of mother nature, the ability of animals and plants to feed them. Survival priorities in everyday life were maintained because existence depended on them. People these days seldom think of such things because government agencies and tech-

ological progress have assumed the burden.

A sudden natural or man-caused disaster can disrupt the supply of our basic life necessities; stop the services of electricity, fuel, and water; destroy our habitats, shelters and possessions, forcing man to forage for food, warmth, and shelter, or to wait for others to provide these essentials. Such incidents cause havoc in a population unaware of life’s basic requirements and inexperienced in self-reliance. It is this lack of knowledge of the priorities of life and the potential enemies that can threaten life that has created a need for basic survival education.

Any person, anywhere on this planet, is subject to some risk to life. Natural disaster, explosion, fire, pestilence, famine, and war — all challenge life and upset the supply and services balance.

In a major disaster, man may be helpless to provide even the most basic of his needs — warmth, water, food. Worst of all, man not only loses all modern civic services, but he loses the source of his employment and hence all monies to barter or purchase necessities. A short-term threat to life can happen easily when one is traveling away from civilization; or it can happen when our modern, mechanized civilization suddenly leaves us, as in natural or man-caused disasters. Such events can drastically change our familiar environment into one that is hostile to life.

(Continued . . .)

NOT ALL PEOPLE MOVE AT THE SAME SPEED. OR ENJOY THE SAME THINGS.

Children don't recognize fatigue.
EXPECTING STRENuous ACTIVITY?

FORTIFY YOUR BODY WITH VITAL SUPPLIES.

- Protein
- Calcium
- Carbohydrates
- Salt
- Water
- Trace minerals
- Vitamins
- Rest

START THE ACTIVITY WITH A SURPLUS

SOME ACTIVITIES USE FIVE TIMES YOUR USUAL REQUIREMENTS.

MOST SUCCESSFUL SAR
(Continued . . .)

It is possible to teach the average outdoorsman the basic human body reactions and automatic defenses in environmental and weather element problems. This would give him the knowledge necessary to solve the problems of sustaining life. If the outdoorsman can recognize his body’s enemies in time to improvise his needs, and can support the body’s automatic defenses, it may be possible to prevent serious consequences.

Knowledge about your body — its energy, its priorities, its enemies — acquired by study or practice, will be an important asset in any unexpected emergency that threatens your life. Acting out the solution will depend upon your body’s energy supply, the environmental factors involved, recognition of the danger, your skills and abilities, and your resourcefulness in improvising the defenses needed.

- **The Problem:** Lack of rest (fatigue) — Limited body resources.
- **Why:** Strenuous activity taxes the body mentally and physically; it is the greatest precipitator of Search and Rescue problems.
- **The Solution:** Personal management to allow adequate rest which alleviates the controllable discomforts.
- **Rationale:** Rest is probably the only cure for the major inner body threats and discomforts for outdoor performance and enjoyment. Water and food fuels are the basis for life. Their use creates by-products which can upset the delicate inner body balances and cause serious side effects that complicate the situation. A thorough understanding of water and fuel management is one of the greatest aids in travel away from civilization.

- **The Problem:** Thirst (dehydration)/water management
- **Why:** Water mismanagement creates chemical upset of vital body functions which are detrimental to mental and physical abilities. Primary cause of hypothermia: Your body’s energy coolant reserves are what produce and regulate the body’s temperature. This subject is extremely vital because of the body’s limited reserves of these supplies. It is one of the most taken-for-granted resources we have.
- **The Solution:** Maintaining water needs for inner body chemical efficiency.
- **Rationale:** Survival reports place water, thirst and dehydration among the most important survival problems. Water is essential to the body’s chemical balance, with intake and output of liquids necessary for life processes and normal functions of vital organs. The body needs two quarts of water every day for system balance and efficiency. Lower intake causes gradual dehydration and diminished capability and proficiency.
- **The Problem:** Body temperature management. Blood flow upset due to increased or decreased body temperature.
- **Why:** Unacclimatized people not being able to manage what they
(Continued . . .)

ANALYSIS OF THE CONTRIBUTING CAUSES OF SEARCH AND RESCUE PROBLEMS

- **The Problem:** Improper clothing and footgear in changeable environments.
- **Why:** Creates discomforts that precipitate accidents and allow for physiological upsets.
- **The Solution:** Forethought: Dressing properly for the season.
- **Rationale:** Every individual has a self imposed responsibility to manage his clothing to provide the inner body optimum temperature necessary to maintain mind and body efficiency.

THE HUMAN BODY'S VERY NARROW TEMPERATURE TOLERANCE

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>60°F - 90°F</td>
<td>Normal body unable to rewarm self</td>
</tr>
<tr>
<td>92°F - 104°F</td>
<td>Incapable of self-help</td>
</tr>
<tr>
<td>106°F - 110°F</td>
<td>Incapable of self-help</td>
</tr>
<tr>
<td>Normal body temp. 98.6°F</td>
<td>Range of ability to act and reason for self</td>
</tr>
</tbody>
</table>
MOST SUCCESSFUL SAR  
(Continued . . .)

have inside them, on them, and around them.

- **The Solution:** Knowledge of the signs of body temperature upset in yourself and others. Knowledge of body heat loss and heat gain mechanisms.
- **Rationale:** The body effectively operates within a twelve degree inner core temperature range. Fluctuations beyond this range mean mental and physical helplessness. Simple understanding of physiological functions and reactions, allow a person to recognize problem indicators and impending dangers within the body. If clothing is sufficient, fire is not needed. When clothing is poor, a shelter is necessary. When both clothing and shelter are poor a fire will be needed.

- **The Problem:** Too ambitious an undertaking; poor physical condition; little or no planning; inadequate party for goal; lack of leadership; itinerary not known to others.
- **Why:** People create these problems by going too far, too fast, away from their normal greenhouse environment.
- **The Solution:** These are self-explanatory.
- **Rationale:** Adequate preparation and forethought is a must for outdoor activities. You can’t fool with mother nature. These problems are really individual responsibilities and must be considered and solved before leaving civilization.

- **The Problem:** Could not recognize a potential problem or threat — physically, mentally or environmentally. Weather — no preplanning; terrain — not familiar; had not anticipated a problem — it can’t happen to me!

- **Why:** Modern man depends upon others and the service industry for his daily necessities and lives in a controlled “greenhouse” environment. He does not take the time to preplan, learn about new environments, and prepare mentally for his outdoor adventure.

- **The Solution:** Learn to recognize dangers and threats to life. Learn to reason, analyze, and solve the problems of providing basic needs in sequence of importance. You have acquired knowledge and experience about certain threatening situations. These you can cope with, because you know how they hurt and what to do about them. Strange situations require analysis and comparison for similarity with those you are familiar with. The more you know, the better your chances of choosing the right response action and protecting what you have in you, on you, and around you. Knowledge broadens your action comfort zone.

- **Rationale:** Acquired knowledge is the foundation for judgment and the analytical ability to solve problems. You must acquire knowledge about those dangers that can harm the body, how they harm it, and what you can do about the danger. If you can recognize a danger you can avoid it or improvise a defense against it. Physical dangers are usually visible. It is the invisible, insidious inner body reactions that can take away the use of the mind, brain, and muscles needed to help ourselves.

- **The Problem:** People traveling from artificial environment not prepared to sustain life. People have not learned to protect and conserve their limited body resources.

- **Why:** “It can’t happen to me”; “I can’t afford emergency equipment”; “There’s no room to carry a survival kit”. These are some of the common comments used by the greenhous person as to why he is not prepared. Modern man tends not to want to think about or anticipate future emergencies.

- **The Solution:** Awareness and education as to what items should be carried for preparedness for the home, auto, airplane, boat, or your person, etc. There is no universal kit that will suffice for every situation. The best kit is the one that an individual makes for himself. All kits should contain: instant body shelter, firecraft capabilities, signaling, and warm fluid capabilities.

- **Rationale:** Survival kits are nothing more than a collection of resources which better help an individual provide themselves with the necessities of life. Each kit is manufactured to solve specific problems in a given geographic area. A thorough understanding of suggested components will better insure that the right equipment is available when any emergency arises.
SAR MANAGEMENT FORMS
<table>
<thead>
<tr>
<th>SEARCH MISSION BRIEFING</th>
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<tbody>
<tr>
<td>1. INCIDENT NAME</td>
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<tr>
<td>2. DATE PREPARED</td>
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<tr>
<td>3. TIME PREPARED</td>
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</table>

4. MAP SKETCH
6. CURRENT ORGANIZATION

SEARCH MANAGER

- PLANNING
- OPERATIONS
- LOGISTICS

DIV. __________
DIV. __________
DIV. __________

AIR
- AIR OPERATIONS
- AIR SUPPORT
- HELICOPTER COORD
<table>
<thead>
<tr>
<th>SEARCH MISSION</th>
<th>OBJECTIVES</th>
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<td>ICS 202</td>
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4. OPERATIONAL PERIOD (DATE/TIME)

5. GENERAL CONTROL OBJECTIVES FOR THE INCIDENT (INCLUDE ALTERNATIVES)

6. WEATHER FORECAST FOR OPERATIONAL PERIOD

7. GENERAL SAFETY MESSAGE

8. ATTACHMENTS (if attached)

- ORGANIZATION LIST (ICS 203)
- DIVISION ASSIGNMENT LISTS (ICS 204)
- COMMUNICATIONS PLAN (ICS 205)
- MEDICAL PLAN (ICS 206)
- INCIDENT MAP
- TRAFFIC PLAN

9. PREPARED BY (PLANNING SECTION CHIEF)

10. APPROVED BY (INCIDENT COMMANDER)

| 202 | ICS 3-80 |
### ORGANIZATION ASSIGNMENT LIST ICS-203

**Position:**
- INCIDENT COMMANDER AND STAFF
- SEARCH MANAGER
- DEPUTY
- SAFETY OFFICER
- INFORMATION OFFICER
- LIAISON OFFICER

**5. INCIDENT COMMANDER AND STAFF**

**SEARCH MANAGER**

**6. AGENCY REPRESENTATIVES**

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<tr>
<th>AGENCY</th>
<th>NAME</th>
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**7. PLANNING SECTION**

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**8. LOGISTICS SECTION**

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<td>SUPPORT BRANCH</td>
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<td>DIRECTOR</td>
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<tr>
<td>SUPPLY UNIT</td>
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<td>FACILITIES UNIT</td>
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<td>GROUND SUPPORT UNIT</td>
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**9. OPERATIONS SECTION**

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<td>DIVISION/GROUP</td>
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**10. AIR OPERATIONS BRANCH**

| AIR OPERATIONS BR, DIR. |
| AIR ATTACK SUPERVISOR |
| AIR SUPPORT SUPERVISOR |
| HELICOPTER COORDINATOR |
| AIR TANKER COORDINATOR |

**11. SERVICE BRANCH**

<table>
<thead>
<tr>
<th>DIRECTOR</th>
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<tbody>
<tr>
<td>COMMUNICATIONS UNIT</td>
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<tr>
<td>MEDICAL UNIT</td>
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<td>FOOD UNIT</td>
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**ICS 1/82**

**PREPARED BY** [Resources Unit] 7540-130-0284
DIVISION ASSIGNMENT LIST

1. BRANCH

2. DIVISION/GROUP

ICS 204
(1-82)

3. INCIDENT NAME

4. OPERATIONAL PERIOD
   DATE
   TIME

5. OPERATIONS PERSONNEL
   OPERATIONS CHIEF
   DIVISION/GROUP SUPERVISOR
   BRANCH DIRECTOR

6. RESOURCES ASSIGNED THIS PERIOD
   STRIKE TEAM/TASK FORCE/
   RESOURCE DESIGNATOR
   LEADER
   NUMBER TRANS. GEAR
   PERSONS NEEDED
   DROP OFF
   PT./TIME
   PICK UP
   PT./TIME

7. CONTROL OPERATIONS

8. SPECIAL INSTRUCTIONS

9. DIVISION/GROUP COMMUNICATION SUMMARY
   FUNCTION
   FREQ.
   SYSTEM
   CHAN.
   SUPPORT
   LOCAL
   REPEAT
   DIV./GROUP
   TACTICAL
   GROUND TO AIR
   PREPARED BY (RESOURCE UNIT LDR.)
   APPROVED BY (PLANNING SECT. CH.)
   DATE
   TIME

418
## MEDICAL PLAN

<table>
<thead>
<tr>
<th>1. INCIDENT NAME</th>
<th>2. DATE PREPARED</th>
<th>3. TIME PREPARED</th>
<th>4. OPERATIONAL PERIOD</th>
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### 5. INCIDENT MEDICAL AID STATIONS

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<th>LOCATION</th>
<th>PARAMEDICS</th>
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### 6. TRANSPORTATION

#### A. AMBULANCE SERVICES

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<th>NAME</th>
<th>ADDRESS</th>
<th>PHONE</th>
<th>PARAMEDICS</th>
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#### B. INCIDENT AMBULANCES

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<th>NAME</th>
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### 7. HOSPITALS

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<tr>
<th>NAME</th>
<th>ADDRESS</th>
<th>TRAVEL TIME</th>
<th>PHONE</th>
<th>HELIPAD</th>
<th>BURN CENTER</th>
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### 8. MEDICAL EMERGENCY PROCEDURES

<table>
<thead>
<tr>
<th>3. PREPARED BY (MEDICAL UNIT LEADER)</th>
<th>10. REVIEWED BY (SAFETY OFFICER)</th>
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<tbody>
<tr>
<td>206 ICS 8-78</td>
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</table>
### Search Team Log (ICS-214)

<table>
<thead>
<tr>
<th>1. Incident Name</th>
<th>2. Date Prepared</th>
<th>3. Time Prepared</th>
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<table>
<thead>
<tr>
<th>4. Unit Name/Designator</th>
<th>5. Unit Leader (Name and Position)</th>
<th>6. Operational Period</th>
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#### Personnel Roster Assigned

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<thead>
<tr>
<th>Name</th>
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#### Activity Log (Continue on Reverse)

<table>
<thead>
<tr>
<th>Time</th>
<th>Major Events</th>
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424
## Operational Planning Worksheet

<table>
<thead>
<tr>
<th>Division Group or Other Location</th>
<th>Work Assignments</th>
<th>Resources by Type (Shown: Strike Team as ST)</th>
<th>Other</th>
<th>Reporting Location</th>
<th>Requested Arrival Time</th>
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<th>TOTAL Resources Required</th>
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<tbody>
<tr>
<td>215</td>
<td>ICS 3-82</td>
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</table>
MAP PROBLEMS
LAKELAND VILLAGE

MAP PROBLEM

MARCH 15, 19__

SITUATION:
You are the Deputy Sheriff responsible for SAR. At 1200 you received a report from the Lakeland Village Institution for the mentally retarded that Larry Reader, age 15, mental equivalent age about 1½ years is missing. He was dressed in street shoes, lightweight clothing with a heavy coat and blue stocking cap. He was last seen at about 1000 hours while walking in a group returning to the dormitory at Lakeland Village. Several Institution staff made quick search of grounds.

OTHER SIGNIFICANT INFORMATION:

TERRAIN: Plowed fields, scab rock, pot hole ponds and small stands of pines.

WEATHER: Clear, very light wind, last night's low 25 degrees F. Current temperature about 45 degrees F. Forecast indicates current conditions to continue for several days.

Current time is 1215. You have just arrived at the Institution. You have just made contact with the staff member who was with Larry's group and with the person in charge of the Institution. During the past two years you have had four other searches for persons at this Institution. All were found, but not in any one particular location.

INITIAL ASSIGNMENT

1. Make a list of questions (as a group) that you would ask the staff persons present. Be prepared to hand this list to the instructors. Consider Planning Data and Searching Data items, and list them separately.

2. Determine what resources you would want for the period between now and dark (about 1800). (NOTE: The initial Probable Search Area is established for you in this case on the map. Assume that you established it based on the history of the other searches in the area).

You have 15 minutes, then return to the lecture room.
SITUATION:

You are the Deputy Sheriff responsible for SAR. At 1200 you received a report from the Lakeland Village Institution for the mentally retarded that Larry Reader, age 15, mental equivalent age about 1-1/2 years is missing. He was dressed in street shoes, lightweight clothing with a heavy coat and blue stocking cap. He was last seen at about 1000 hours while walking in a group returning to the dormitory at Lakeland Village. Several Institution staff made quick search of grounds.

OTHER SIGNIFICANT INFORMATION:

TERRAIN:   Plowed fields, scab rock, pot hole ponds and small stands of pines.

WEATHER:  Clear, very light wind, last night's low 25 degrees F. Current temperature about 45 degrees F. Forecast indicates current conditions to continue for several days.

Current time is 1215. You have just arrived at the Institution. You have just made contact with the staff member who was with Larry's group and with the person in charge of the Institution. During the past two years you have had four other searches for persons at this Institution. All were found, but not in any one particular location.

INITIAL ASSIGNMENT

1. Make a list of questions (as a group) that you would ask the staff persons present. Be prepared to hand this list to the instructors. Consider Planning Data and Searching Data items, and list them separately.

2. Determine what resources you would want for the period between now and dark (about 1800). (NOTE: The initial Probable Search Area is established for you in this case on the map. Assume that you established it based on the history of the other searches in the area).

You have 15 minutes, then return to the lecture room.
ACTUAL RESOURCES AVAILABLE

- 30 volunteer ground searchers from the immediate area. Have been on several searches before. Several moderately well trained crew leaders among them. Tracking these people have had the initial "Ab Taylor Course" on human tracking.

This group has several private vehicles.

- One air scent dog handler. About 60% completed with established training program. Has been on a couple searches before but basically in a training status.

- Four 4 X 4 vehicles with drivers.

- Six institutional staff.

- Three of your deputies with their vehicles.

- Adequate communications.

This is all that is available until 1800 today. All of the above resources can be at your location by 1330.

ASSIGNMENT

As a group, do the following:

1. Show on the map transparency and be prepared to discuss how you would deploy these resources during the remainder of the daylight hours.

2. What would you plan to do during the first night if he is not found by dark?

3. What additional resources would you request for tonight and for tomorrow?

You have 30 minutes, then return to the lecture room.
**QUESTIONS**

- WHERE RETURNING FROM
- EVER RAN AWAY BEFORE
  - ATTRACTIONS
  - SHIRT
  - RADIO TOWER
  - OTHER KIDS TOOK OFF PEL
- PLSS
  - WHAT BUILDINGS, GROUNDS AREA SEARCHED?
- ENTIRE LOST PERSON QUESTIONNAIRE FILLED OUT?
- FAVORITE PLACE?
- ONLY ONE MISSING?
  - HOW MANY STAFF SEARCHING.

**PLANNING / SEARCHING DATA**

- SCENT ITEMS

- RESOURCES
  - HELICOPTER
  - FAST TEAM
  - TRACKING DOGS
  - USAF
  - USAF SEARCH CREWS
  - MEDICAL
  - FOOD / SLEEPING RESOURCES
  - NUGS

- KEY WORDS
  - INVESTIGATORS
  - SEARCH
  - COORDINATOR
  - PLANNING
  - MEDICAL
  - NUGS
  - BACKUP
STUDENT HANDOUT

LAKELAND VILLAGE
MAP PROBLEM
CONCLUSION

SCHOOL SOLUTION:

1. Initiate confinement (roving patrols) along established POA perimeter.

2. Re-search the Institution grounds and facilities using Institution Staff with trained supervision (deputy?).

3. Immediately sign cut along a line in each direction from the North-South portion of West Washington Road.

4. Use lookouts (Booth Hill)(Water Tank?).

5. Immediately check significant features - water tank, Booth Hill, houses, barns, big pot holes, etc.

6. Assign one deputy to immediately continue with investigation phase.

LEARNING POINTS:

- Urgency factors indicate high priority.

- Confinement.

- Sign cutting.

- Investigation.

- Subject is a person with 1-1/2 year old mentality but a 15 year old physical capability - capable of traveling quickly and far.

- Don't rely on Institution Staff's statements that they've "searched" the immediate area. Have it done again, thoroughly, with close supervision.

WHAT ACTUALLY TOOK PLACE

Boy was ultimately found in the largest of the three buildings at the end of the unsurfaced road running south from Fancher Road in Section 22. Sometime earlier, another lost boy from Lakeland Village had also been found in this same barn. Recalling that, the Sheriff called the rancher and asked him to check the buildings. The rancher called back and said there was no one in the buildings. Larry was found a while later, asleep in some hay.

Map Problem- Lakeland Village
MAP PROBLEM

ROCKY MOUNTAIN NATIONAL PARK
January 24, 19

SITUATION: You are the ranger in charge of SAR. It is 1000 and you have just received a call from a college student who reports that two friends of his are overdue from an overnight hike to Longs Peak. Fred Stone and Joan Jardine left Fort Collins at noon on Friday, January 21 and were supposed to return on Saturday, January 22. They were planning to go into Chasm Lake.

WEATHER: Moderate to heavy snowfall Friday and Saturday. Winds were light to moderate until Saturday night when they became heavy. Sunday was clear to partly cloudy with little wind. Snow depths heavy in higher elevations and avalanche danger high. Temperatures from -5° to 15°.

INITIAL ASSIGNMENT

No other information is immediately available. There are four rangers available to immediately move out on skis and seven other experienced volunteers available in two hours. No other resources available until tomorrow morning.

As a group, determine your immediate actions. You have 10 minutes -- then return to the lecture room.
SITUATION: You are the ranger in charge of SAR. It is 1000 and you have just received a call from a college student who reports that two friends of his are overdue from an overnight hike to Longs Peak. Fred Stone and Joan Jardine left Fort Collins at noon on Friday, January 21 and were supposed to return on Saturday, January 22. They were planning to go into Chasm Lake.

WEATHER: Moderate to heavy snowfall Friday and Saturday. Winds were light to moderate until Saturday night when they became heavy. Sunday was clear to partly cloudy with little wind. Snow depths heavy in higher elevations and avalanche danger high. Temperatures from -5 degrees to 15 degrees.

INITIAL ASSIGNMENT

No other information is immediately available. There are four rangers available to immediately move out on skis and seven other experienced volunteers available in two hours. No other resources available until tomorrow morning.

As a group, determine your immediate actions. You have 10 minutes -- then return to the lecture room.

1. Trail head v for pov, check county registration
2. Weather forecast
3. All 5 rangers in team to Chasm Lake - based on cond from out by night, radio from evening.
4. Request a man, dog, 1 log, 20 men, more volunteers, same investigation
5. Interrogation request to homes, start investigation
6. 1 ranger/1 vol. Per ready to go on deck.
7. Radio v other trail heads
Factors:
- Weather
- Cabins
- Time
- Victim's experience, personal traits, habits
- Reported travel route - destinations
- Topography - ridge line, trail markers

Resources:
- Avalanche Dogs
- Heli - specialized high altitude
- MEA - ski teams, 12 tons of 6 skids
- Relief - County 50
- Logistics - food, ARC, bedding
- Snowmobile/4x4 teams check houses, assist
- ARC
- Buffalo Light
- Medical
1/25 -- 0700

Partly cloudy today, increasing cloudiness with more snow later today, tonight and Wednesday. Strong winds. Avalanche conditions high to extreme.

1/26 -- 0700

Cloudy with snow flurries all day, strong winds to 50 m.p.h., visibility maximum 1 mile. Temperatures 5-15 degrees F.

1/27 -- 0700

Same as yesterday.

1/28 -- Same except winds snd snow heavier.

1/29 -- Clear, windy, 0-15 degrees F.

1/30 -- Same as yesterday.

1/31 -- Clear, light winds, 0-15 degrees F.
CLUE

A keetly pack is found above Peacock Pool, halfway up slope to trail. It contains:

- Foam pad
- 3 T-Bone steaks
- Left glove
- Eggs
- Can green beans
- Frying pan
- Map of the park
- 2 sleeping bags
- Head of lettuce
- Compass
- Reasonably good survival equipment
- Miscellaneous

The strap was torn off from top and bottom and the side of the pack was torn. Fall indicated. There were urine holes in snow close by. Pad and one sleeping bag (wet and frozen) were outside pack.
Attached is detailed information obtained from friends of Fred and Joan.

As a group:

1. Make a list of all the significant factors involved in determining the probable search area and segmenting it.

2. Then, using these factors, segment the area and assign probability values.

3. Determine what other resources you want for tomorrow morning and how you deploy them.

You have __ minutes, then wait for further instructions.

Wednesday morning, January 26, 1972 -- Craig Renkert of 4953 E. Iliff, Denver, had an interview with Jim Randall and Bill Mekeel at Park Headquarters, after having had a meeting the night before with friends of Fred and Joan to get any kind of information that might be helpful (their meeting was in Ft. Collins).

Most of the interview was put on tape with Dave Butts' Norelco Carry-Corder. The following is a transcription of that tape.

Description of Fred Stone:

6'1", 198 lbs., brown hair, shoe size 11, took from Ft. Collins Dunham lugsole boots (med. wt., mtn. boot). Assume took with him as not in car. Did rent light weight ski touring boots, so obviously was wearing those. Now the definite equipment he took with him, we are not real sure of because we couldn't get to his house and his roommate was so shook up that he didn't know exactly what he had taken, but these are a list of the things he normally takes and would probably have with him.

-- Brown Gerry parka.
-- Yellow wind shirt.
-- Probably wore jeans; he may have worn brown ski pants but it's kinda doubtful.
-- Brown stocking cap.
-- Ski gloves.
-- Sleeping bags, recreation equipment blue down w/3# down in it, blue foam shorty pad, both were borrowed. Bag had a gray flannel liner.
-- Presumably he had no map although there was a report he did buy one on his way up here or when he got here.
-- He has studied maps in the library at CSU and did have the little Forest Service map that is given out free; I mean the Park Service map.
-- He has no compass, is carrying a red Kelty A-4, no stove, no headlamp or flashlight, although there was a flashlight wrapper in the car, along with some film wrappers which may indicate that he bought one on the way up. He may have taken a candle. Friends have done this
before on the trips that these friends have been with, he hasn't taken it, but the friends have carried it.
-- Other equipment -- not much.
-- Food--he's not one for munchies, so there'd be no candy bars or things like this.
-- A mountaineering friend asked him what he was going to take in the way of food (Mark X. Burke) and he said not much.
-- He presumably took a bottle of wine and some cheese. This was pretty standard on their trips, and other food they probably bought on the way up as they didn't take anything from the apartment.
-- He left an army canteen in the car so evidently didn't have it with him.
-- For smoking -- Fred does not smoke at all.
-- Drinking -- he does drink, he doesn't get drunk very easily, he is a big boozier back at the dorm, or back at CSU, but can really hold his liquor.
-- Drug-wise -- not really important here. A little bit of marijuana, but nothing to any extent that would indicate any reason to be using it up here. He wasn't an owner of it and didn't normally have it.
-- For hobbies -- Fred doesn't like animals to a certain degree, but he's basically a hunter type, although he doesn't do much hunting and didn't do any hunting this past season, but when one friend came in and told his story about hunting, Fred was very envious and has hunted before, either in Minesota or out here.
-- He also has a very strong arm, according to his snowball friends which could mean he would kill something--stick, stone, something like this if necessary, and he might know how to prepare it.
-- (Mekeel -- any indication of matches or fire?)
-- Joan definitely had a lighter. Let me go over Joan's straight facts, here, now, then we'll get into personalities and such.

Description of Joan Jardine:

Joan's height is 5'2". that's a very definite height that's different from what we've had before, according to her friends. Weighed 125. Shoe size is 7. She had a pair of light weight kletter shoes which would not be very adequate for these conditions. She also had the skis, touring skis. She borrowed a small orange canvas day pack. (Randall -- let me ask you, did she rent ski boots?) Yes, they both rented touring boots. She wore a purple tunic and a turtleneck. No down jacket or any other thing like this. She did have a down windbreaker. A yellow down windbreaker or windshirt, no down. For sleeping bag, she borrowed (Randall -- yellow windshirt now, they both had yellow windshirts?) Yes, they did. Sleeping bag was borrowed, it was a down and feathers bag. The girl who she borrowed it from did not know too much about it. The most important thing is she bought it from a sporting goods store in California on sale for the price of $50.00. Price indicating not too good a bag. A cheap imitation down bag. Fred has used the technique before of combining bags, and the two of them sleeping in it. Joan left a list of the equipment that she was packing for the trip, which included toothpaste (Crest), toothbrush, Aird deodorant, Nervana face cream, make-up base, eye makeup, mascara, Maybelline, vaseline, bobby pins, flannel pajamas, underwear, pants, boots, jacket, turtleneck, tunic, and she has down here long underwear. Now according to her friends, she did not take any long underwear. (Mekeel -- I questioned her roommate on that and she said she might have had tights or leotards.) She has ski gloves, the're not mittens. Hat-wise, she has two hats with her. They're a knit hat that looks kind of like a beret, a girl's type of that, looks kinda like a mushroom. It's
white -- one is white with a tassel, the other one is blue. (Randall -- the other is a blue knit cap, huh?) Yah, they're both knit. They're not the stocking cap variety though. Joan does smoke, medium to light around Fred, otherwise medium to heavy. Supposedly smokes Larks. We found in the car an empty pack of Winstons, and an unopened pack of Lucky Strike filters. When she gets nervous she smokes very heavily. She definitely has a lighter with her. She also drinks to a certain degree, does use marijuana on occasion, but wouldn't use it with Fred, that was the indication -- she doesn't own any normally.

Hobbies -- not too much related to the mountains, she's a very good, an excellent downhill skier and did go out cross-country once last weekend.

Now to get on with what has happened activity wise before this (Randall -- incidentally, if there's anything you don't want on the recorder you can flick off the button) okay. Joan was cross-country skiing last weekend. She went to Lake Eldora with three friends, two couples, and this was her first time on cross-country skis. They left the car, cross-country skied up and back, came back to a different location from where the car was and had to hike back to the car. Fred was up to Summit Lake last weekend as the register says. He didn't make it to the cabin. He got to a point to where he could see the cabin, but never got a look inside the cabin or a close look at the cabin itself, so he knew where it was. (Mekeel -- then he knew how long it should have taken him to get up there). Yah, basically, he did it in three hours and back in like 45 minutes. So he got up there and didn't get inside the cabin. He and some friends had stayed at another cabin somewhere around the area, the Front Range area, where the cabin did have a stove so Fred could have assumed the cabin would have a stove and therefore no reason to take one. But the cabin doesn't have a stove. So anyhow. Then (Randall -- of course you don't need a stove if all you've got is wine and cheese). Yah. (Randall -- except you do for tea or something, but I think he would have taken something more but not much.) He wasn't one for munchies so he took -- what did he take for breakfast? Probably sweet rolls, these are what the kids I go with take for breakfast that are this type of people.

Then the plan was, according for this weekend, the original plan was to go up to a Rist Canyon, that was in the report that I read coming over here the other ranger had, but then that kinda fell through and the big plan, after Fred was up here last weekend and had such a great time, he had big plans for a large group of couples to come up and spend the weekend up here, at Chasm Lake and do it overnight, and this was for the weekend of the 29th, which is this coming weekend. He was going to Rist Canyon -- that fell through, then he had plans to go to Hidden Valley for some downhill skiing with Joan, but he called Hidden Valley on Thursday, found the conditions, he called a friend who was up there on Tuesday, found skiing conditions pretty poor so decided to do something else. Thursday night he decided to go cross country skiing again up to Chasm Lake. He asked several friends -- boyfriends -- to go with him. They all couldn't make it, so it kinda came down to Joan as a kind of last resort to go with him. She didn't know about it until an hour before they left. She was very excited about it, and, but she was kinda worried about the trip because after last weekend's cross-country ski trip, she came back very exhausted, and it was more work than she thought it would be and she was worried about the distance. Fred definitely mentioned the distance, 13 miles in reference to a downhill Saturday skier. Now the 13 miles was very definite in all the friends' minds and it was presumably over a Granite Pass or down towards the Glacier Basin area. And this is what worried Joan -- was the Map Problem- Rocky Mountain Nat. Park 288
distance in the ski-out. But she was still very excited about the trip.

To get into their personalities and their relationship a little bit -- Fred has a girl back home in Minnesota, who, the scuttlebut has it, is about to be his fiance, and such. The girl's name is Margaret. Joan at one time, the two of them were very close, from both sides of the picture. Joan was trying to work into Margaret's place in Fred's life. Joan's idea was to be at one time Fred's fiance type of thing. It was more, well Joan was more involved in Fred than Fred was in Joan. (Randall -- but you think Joan was still quite interested in Fred.) Yah, she was very interested in him last quarter, before December, but then since that time, things had begun to drift apart a little bit. Fred's become a little more disinterested and Joan has gotten the idea, and such, and realized what's happening. So she's not quite so demanding on him, although she still has more interest than he does I think. So their relationship now is good friends. She's not just one of the guys type of thing yet, but she's not a Saturday night girl to go out and hit up the night clubs type of thing, so she's a good friend to do things with together. (Mekeel -- what year is she?) I'm not sure, should be a Junior. Fred was in pre-med supposedly and Joan was in occupational therapy. They both had first-aid. (Mekeel --he's got a first-aid instructor's card in his wallet.) He does? Did he have his draft card in his wallet? (Randall -- yes.) No money though. (Mekeel -- no.) I found $4.00 in the glove compartment this morning, but Fred was, both of them were very well financially taken care of by their parents. Joan didn't have any problem, Fred was a little bit more, not quite so free spending. I don't think he was, not one to be hard up for money, but he wasn't one to continually ask for new and better luxuries.

To their physical condition:

Fred's very strong, he'll do anything to prove himself. He's not going to be swayed by weather, and if something's there he'll conquer it. He has had some camping experience in Minnesota canoeing, but no winter mountaineering experience (Mekeel -- until this year). Well, yah. (Mekeel -- these recent trips.) Like you say that isn't much in the way of any good training, so he's basically not associated with the mountains. Most of the time he goes, up in Minnesota, he goes to shelters, shelter cabins, not in tenting, and everytime he's gone here in Colorado, he's been to shelters. (Mekeel -- should have been snow caves, this type of thing.) Well, he is aware of the concept of snow caves, this Mark X. Burke said that he was aware of them and I think Mark told him about them on his last trip. I think they discussed them, but he's never had any good training in survival that we know of. But summerwise he should be pretty good with camping and such. I believe he was a camp counselor for one year, basically for fun.

Joan's condition -- she's not very strong. She's an excellent downhill skier but she's not a physically strong person. She has a very strong mind though. She and Fred have a sort of competition going as to who's going to break first. They went on a trip here a couple of weeks ago with some friends, up some canyon, and Joan sprained her ankle and didn't tell anybody about it, especially Fred. She wanted to prove to Fred that she could take it, and she couldn't be undone. (Mekeel -- she had mononucleosis, apparently too, just before Christmas. Her father is a little concerned she hadn't fully recovered from that.) Yah. She had mono I guess starting at Thanksgiving, recovered and came back out to Colorado the 27th of December, was in Breckinridge skiing with the family, passed out at dinnertime and took some time to recover, but that's fairly recent so she really hasn't had much time to climatize or to
build her physical condition back up. She won't let Fred beat her so, you know, when she starts getting tired she's going to go until she collapses, she's not going to tell Fred she's tired and time to take a break. She's gonna continue to go on and Fred will continue to push her when she starts getting tired, to whatever destination he has. Joan has a bad back. Couple of years ago, she fractured a spinal cord in an automobile accident and she takes back pills. She didn't bring the back pills with her, they're back in Ft. Collins. Fred does know about her bad back and if she injured it either too strenuous cross-country skiing or carrying a pack she could not be moved.

To get into the psychological conditions, this past week Joan's kinda had a bad time. The guy she went cross-country skiing with last weekend is a Christian Crusader and has been trying this week to get her to join the movement and she's been fighting it. And one time, one night, she was (Randall -- this other guy her boyfriend?) Yes, not serious dating boyfriend, but another boyfriend and this Christian Crusader came down to see her, saw she was with another guy, went up to her room, wrote her a very nasty note, and since then they had a discussion and he really picked her apart saying that she wasn't all the girl that she could be because she's not a Christian Crusader. And she got very emotionally upset, according to her friends about that. So this could be an emotional strain for the trip. She did bring this to Fred so Fred knows about that situation. There have been times in the past when she and Fred have worked problems out together very well. They've had good communications under some circumstances. On other situations, other topics, they've had complete mental blocks against each other. One of these is this physical block and they'll both try to outdo the other.

She can drive, she has no driver's license, but Fred did let her drive once and this was his VW with the clutch and supposedly Fred operated the stick shift, but none of her roommates would let her behind the wheel of their car, none of her friends. A year ago through her occupational therapy work, she worked with retarded children, she had a nervous breakdown due to one of the children she was working with. She became very attached to, and the boy ended up killing himself, a little boy, and after that she had a nervous breakdown.

She's very afraid of heights. Ten feet and she becomes petrified. She's a very high strung, very hyper girl. She hates to be alone in the dark, she hates to be alone, period, she hates worse to be alone in the dark. Fred knows this so that if they were to be stopped and if she were injured, she were still conscious, she would not let Fred leave her. Now if she goes to sleep and Fred decides to make a run out and back in four hours, or something like this, who knows what she'll do if she wakes up and finds Fred gone.

To get into Fred's psychology, Fred's very stable. Nothing bothers him at all. The only thing that his friends have ever known to ever phase him at all, was he had a bad auto accident here last summer in Minnesota, he rolled his VW. This was about 1:00 o'clock in the morning. He woke up the next, he was unconscious, and no one found him or did anything. He woke up and saw what had happened, still no one finding him. At that point he got in the car, drove the car to Margaret's house, his girlfriend back home, and then two days in the hospital. Cut his lip very badly and consequently has very bad chin scars. But this is the only thing that has ever bothered him at all. (Randall -- must have rolled back right side up?) Evidently. Doesn't take much to roll a VW over though. One friend said that he cried after the accident. Fred told this friend that he
cried after the accident.

Fred loves competition in anything and everything. They're both very excellent students, never miss classes. Fred is the leader of the group at CSU and he has a (Randall -- what type group?) well, the gang, his friends. He's not one to be big and boisterous, but he gets everybody else to want to do what he wants to do. He's a good talker. One friend said he'd make an excellent lawyer. He is in a fraternity, it's Delta Tau Delta, he pledged this but never really de-pledged, just kinda faded out of the scene. He's kinda of what one friend referred to as a social member. He's active in social activities but not on their active roster. He does have this water safety instructor badge. Other than that. So Fred's not going to have any problems mentally, I don't think. He can handle that situation. If something happens he still should be able to take care of it. (Randall -- okay. There's nothing in any of this that indicated that they would have pulled some shenanigan to elope or get away.) No, very definitely. They're not at all inclined to this, as their relationship is not that way. (Mekeel -- the other thing, she didn't have a car. I checked out, I phoned down the other day to check to see if she had a car, as we were going on the assumption it was there, but if she don't drive she didn't have a car.) We tried to check with other friends, what else would have happened, you know, say they would have gotten in a hospital. They would have called. Their friends are close enough and they're open enough to, you know, know that Joan would have called or Fred would have called because her friends would be out looking for them. They've checked all friends in Ft. Collins and no sign of them. No other friends to speak of. Fred did live in Loveland at one time, but the friends he knew there have since moved out. He does have a Mary Kresbech who is in Regis in Denver, but they were, friends were all convinced they wouldn't do anything like that. No reason to.

One other cabin or place they might be if they're not here is the cabin at the water works plant down the canyon.

(switched tape here)

It's my opinion that they got up there and due to the physical competition they wouldn't stop due to weather, due to tiredness, something like that, they would keep going. It was Fred's opinion to seek his goal of going over Granite Pass or something in that area and skiing down towards the Glacier Gulch, and Saturday, so I think they probably spent the night hopefully in timberline up there Friday someplace other than the cabin, and Saturday would get up and continue on if they made it through the night. I think Fred has enough knowledge to build either a lean-to out of boughs, maybe a snow cave, although I don't think they had the equipment to make a snow cave. One friend said Fred could reason out a snow cave himself. So I would tend to believe they're down that creek that comes out of the Boulderfield, down that drainage or down that trail somewhere. Probably not too far from the Granite Pass area and I presume that one of them got injured and the other one stayed with him. (Randall -- were tired, hypothermia, or whatever). Yah. Joannie's back trouble, maybe, and Fred would stay with her. (Mekeel -- in her weakened condition, hypothermia, or). Yah. Anything like that. That's straight speculation. Anything else I don't know. (Randall -- the snow Friday and Saturday was pretty much without wind, at least somewhat without wind, then Saturday night the wind came up, and so that Sunday there were tougher conditions. But Sunday was a good day. Actually, Sunday turned out to be a really nice day as for sun and all, but they could have easily made it out and if they weren't in
trouble on Sunday.) Yah. (Randall -- so I think they had trouble up there, like you said.) I think they've got the mental stamina to survive by state of mind, only if so much of survival is the mind and not the equipment. (Mekeel -- Mr. Jardine said yesterday when I was talking to him along these same lines, he said that she never quit nothing, that boy, she was hardheaded as heck when it comes to this type of thing. Her hardheadness would carry her through where her physical condition often times wouldn't.) (Randall -- she apparently felt real emotionally stable from that other thing although that could shake anybody up. But you think mental stamina is. . .). Yah. To keep up with Fred was really heavily emphasized last night.

(Randall -- before we quit recording, if you would identify yourself and the date this is recorded, and also the time and place and all where you taped this information.)

Okay. I'm Craig Renkert with the Alpine Rescue Team of Evergreen. On the search for Fred Stone and Joan Jardine, date today is January 26th, time 9:45 a.m. I picked up this information from Fred's and Joan's friends, mostly Fred's friends, and two of Joan's friends, her best friend who is, had quite a bit of information and was very helpful. On the night of January 25th in Ft. Collins, a meeting was set up by a Mark Burke, a fairly close friend of Fred and another guy by the name of Rick, I don't remember his last name, who was an old ART member who initially called the rescue team and got the search started.
CLUE

Two pair of skis and poles are found at the junction of Jim's Grove and Alpine Brook, anchored with rocks and with just the tips showing. An outfitter is contacted who confirms they were rented to Fred and Joan on January 21.
Joan’s body is found near 9400 foot contour at bottom of Roaring Fork. The following is a list of the items in her possession.

Joan had on the following:
-- Blue Kletter shoes, on feet. (Alpo Italiana Roccia)
-- Brown leotards (pantyhose).
-- Socks under the leotards.
-- Blue jeans.
-- Yellow pullover windbreaker w/hood.
-- Plume and blue wool tunic.
-- White wool or cotton sweater.
-- Silk panties.
-- Bra.
-- Leather ski glove on right hand. (Hand clenched inside in a fist)
-- Left hand bare but w/gold ring, w/clear stone.

Joan also had the following with her and outside the pack:
-- Left glove.
-- Blue bead necklace.
-- Lucky Strikes (17 -- almost full pack).
-- Colored panties tied to a stick with rubber band.

These items were soaked and frozen:
-- Dress.
-- Blue knit beret.
-- Nightgown.
-- Long Johns cotton waffle-weave (bottoms).
-- Purple hand towel.
-- Pink hand towel.
-- One sunglass lens.
-- Soap dish.
-- Cigarette lighter.

Items in a small orange-red with yellow straps day-pack. Listed in the order they were taken out from the top to the bottom.
-- Occular lubricant.
-- Touch & Glow cream makeup.
-- Purse w/bobby pins, lipstick, eye makeup, mascara, contact case without lenses.
-- One bra.
-- Hairbrush.
-- Toothbrush.
-- Comb.
-- Arid deodorant.
-- Crest toothpaste.
-- Tube of face makeup.
-- Tawny face stick
-- Curler kit.
-- One cigarette butt.
-- Snow.
-- Tube of skin cream.
INSTRUCTOR INFORMATION
RESOURCES

1/24
4 rangers from 10:30 a.m.
7 volunteers from 1100

1/25
29 additional volunteers
3 snowmobiles (available first light)
1 helicopter 0730

1/26 -- Totals
8 rangers
70 volunteers
5 snowmobiles
1 helicopter

1/27 -- Totals
Same as yesterday

1/28 -- Totals
8 rangers
40 volunteers
1 helicopter
5 snowmobiles

1/29
Same plus 50 Army Personnel (less experienced)

1/30
8 rangers
20 volunteers
50 Army
2 dogs and handlers from 0900
1 helicopter
5 snowmobiles

1/31
8 rangers
2 dogs and handlers
1 helicopter
3 snowmobiles

Map Problem - Rocky Mountain Nat. Park
1/24 -- Four rangers reached Chasm Lake. No one there, no sign of anyone having been there. Weather very poor. Volunteers checked Alpine Brook Crossing and Eugenia Mine areas, nothing. Jim’s Grove area (outhouses) checked at 1900 -- nothing.

1/25 -- Eugenia Mine, Alpine Brook, Mills Moraine, Chasm Lake, Peacock Pool and Upper Roaring Fork drainage searched by ground. Helo covered higher areas but could not get excellent coverage. Snowmobiles searched lower roads, etc.

1/26 -- Same areas covered more thoroughly -- search expanded to other likely adjoining areas.

1/27 -- Same areas covered. Skis and poles found 1020.

1/28 -- Same areas covered. More concentration around Jim’s Grove. Joan’s body found 1315.

1/29 -- Same areas with greater concentration around where Joan’s body was found. Kelty pack found 1435.

1/30 -- Search concentrated near Peacock Pool. Dogs arrive there at 0900 and are flown out at 1500. A 28 year old man from Oregon arrived at Park headquarters and said he had been sent by "God" to find Fred Stone. Persuaded to stay out of park.

1/31 -- Search efforts cut way down. All efforts concentrated from Peacock Pool down drainage to below where Joan’s body was found. Dogs depart at end of Friday.

2/1 -- Four men continue limited search of drainage.

Limited searching continued periodically. On August 3, two pair of ski boots were found in Roaring Fork drainage. On August 4, the body of Fred Stone was found by dogs from the Denver Police Department.
CONCLUSIONS

It seems likely the two got to Jim's Grove with no problems and stored skis there (a common practice since snow much more firm from there on) and headed for the shelter. Apparently, for one reason or another, Fred fell on the steep ice slope above Peacock Pool, rendering his pack nearly impossible to carry and perhaps injuring himself. They may have stayed there or rested, then deciding to go on out the Roaring Fork Drainage. In all likelihood, he collapsed and she tried to go on alone for help.

LEARNING POINTS

Investigation: Detailed interviewing of friends of subjects' did not take place until late on 1/25.

Resources: Dogs not brought in until 1/30/

Emergency Preparedness Education:

Lack of this probably accounted for the deaths. Friends confirmed that the pair expected to stay in a shelter with fireplace and other amenities. Equipment carried by the two confirm this. Although they did have reasonably good outdoor equipment, their knowledge and experience was limited.
SITUATION: You are the District Ranger. At 1430 you receive a call from the Sugarlands Visitor Center informing you that a scoutmaster has just reported one of his boys missing after an overnight trip into Icewater Springs Shelter. The following information is relayed to you.

Group of four, Scoutmaster Smith and three boys from an Explorer Post, had spent the night of February 7 at Icewater Springs Shelter. Mr. Smith, Geoff and Wolfe departed the Shelter toward Newfound Gap about 0900, leaving young Smith behind at the Shelter for last minute cleanup. Geoff was moving slowly and the three stopped to rest at the junction of the AT and the Boulevard Trails. Mr. Smith and Wolfe started on ahead, leaving Geoff at the junction at about 0930. They reached Newfound Gap at about 1030. Young Smith arrived 20 minutes later and upon questioning had not seen Geoff since the three left the Shelter. The three returned to the Shelter, went on out the AT to Charlie's Bunion and out the Boulevard Trail about ¼ mile but saw no sign of Geoff. They returned to NFG and proceeded to Sugarlands Visitor Center to give the initial report at 1420.

The attached Lost Person Questionnaire is prepared summarizing the information. In addition, the following information is significant:

TERRAIN: Elevation along AT 5050 to 6050. Fairly steep grades on trails for short distances. Thick Eastern hardwood and evergreen forest with heavy underbrush (laurel, briers, etc.). Both deciduous trees (leaves gone) and evergreens. Sides of drainages very steep in places.

WEATHER: Intermittent snow flurries predicted at least through noon of February 10. Up to 6" or more new snow tonight at higher elevations. Cloud cover expected through February 11. Temperatures in low 20's at night at higher elevations and 30's during the day. About 6-8 inches of snow along the AT now. Moderate winds.

It is now 1620 and you have arranged to meet with Mr. Smith and the other two boys at the Alum Caves parking area.

INITIAL ASSIGNMENT

1. As a group, determine what further information you want from Mr. Smith and the other two boys.

2. Considering the immediate needs, what other information would you try to obtain (Planning Data and Search Data)?

3. What, specifically, would you do next?

You have 15 minutes, then return to the lecture room.
Date Feb 8, 19—— Time 2:20 pm

Name Hague, Geoff ——— Sex M ——— Call Name “Jeff”

Address Morristown TN ——— Phone ——— Age 16

Weight 130# ——— Height 5'11" ——— Color of Hair Brown ——— Glasses? yes

Jewelry none ——— Companions see below *

CLOTHES WORN: Hat Red ——— Shirt or Dress long-sleeved sweatshirt

Coat or Jacket Black corduroy ——— Pants Blue chinos ——— Shoes Brown boots

Shoe Size 7 (boys) ——— Condition good ——— Sole Pattern (over) smooth sole + heal

Stockings ? ——— Other clothes Black mid. length gloves ——— Money no

Things carried Knapsack, clothing, bedroll, assorted food

Contents of pockets matches

TYPE OF PERSON: Hardy ✓ ——— Frail ——— Agile ✓ ——— Clumsy

Shy ✓ ——— Easily Frightened no ——— Aggressive

Health Condition good ——— Heart good ——— Hearing good

Mental Condition good ——— Outdoor Knowledge fair (no exp. in mts. in winter)

Will answer to whistle or call? ——— Right or Left Handed right

Familiar with Country in which lost? no ——— Date Lost 2/18

Time Lost 9:30 am ——— Ever Lost Before? no

Plans of Lost Person return to Newfound Gap

Reported by Eugene Smith (leader) ——— Relation scoutmaster

Location of Reporter visitor center

* Eugene Smith - leader/scoutmaster
Lee Smith - age 15 (son of Eugene)
Stephen Wolfe - age 16

all members of Explorer Post *
Lassen Volcanic National Park

Map Problem

October 10, 19__

Situation: You are the ranger in charge of SAR. It is 2145, and you have just received a phone call from Dr. Austin Smith informing you that his son is missing from a hike. You assemble the following information, along with that on the attached Lost Person Questionnaire:

Dr. Smith and his son, Matthew, age 16 and twin sons, age 11, were returning to Butte Lake after camping two days at Rainbow Lake. When they arrived at the Cinder Cone trail junction at about 1500, the father and two younger boys decided to climb to the top. Matthew said he felt too tired and wanted to return directly to the car, which was parked about 1 1/2 mile away at Butte Lake. His father agreed to meet Matthew at the car. Dr. Smith and the twins began climbing Cinder Cone and last saw Matthew headed eastward on the trail toward Butte Lake at about 1530. At approximately 1630, Dr. Smith and the twins arrived at the car at Butte Lake, but were unable to locate Matthew. Dr. Smith asked visitors he found in the area if they had seen Matthew, but got no clear indication that anyone had seen the boy. There were approximately 30 visitors in the Butte Lake area that day. Dr. Smith used the remaining daylight hours, probably until about 1900, retracing the trail to Cinder Cone, and hiking around the campground calling Matthew's name, but turned up no trace of the boy.

Other Significant Information

Terrain: Elevation 6000-8000. Some steep slopes and gullies. Lava bed areas extremely rough, devoid of vegetation. Other areas heavy manzanita and moderate timber.

Weather: Low tonight predicted to be 32 degrees F, High tomorrow 68 degrees F. Fair with little wind. Outlook for next several days: clear, fair, Lows--high 20's to mid 30's, Highs--low 60's to low 70's, little wind.

Dr. Smith was phoning from Butte Lake. You have made arrangements to depart immediately and meet him at Butte Lake -- ETA 2215.

Initial Assignment

1. As a group, determine what additional information you want from Dr. Smith.
2. Considering the immediate needs, what other information would you try to obtain (planning data, searching data)?

You have 10 minutes -- then return to the lecture room.
Info taken by phone

LOST PERSON QUESTIONNAIRE

Date October 10, 19 Time 2125

Name Matthew Smith Sex M Call Name Matt or Math

Address Fremont CA Phone — Age 16

Weight 125-135 Height 5'8" Color of Hair Brn Glasses? no

Jewelry none Companions Father, twin brothers

CLOTHES WORN: Hat none Shirt or Dress maroon - long sleeves

Coat or Jacket red down (in pack) Pants maroon Shoes hiking boots

Shoe Size 9 Condition good Sole Pattern(over) transverse ridges

Stockings grey wool Other clothes none Money none

* Things carried olive green backpack w/rolled air mattress on top

Contents of pockets nothing known

TYPE OF PERSON: Hardy ✓ Frail Agile ✓ Clumsy

Shy ✓ Easily Frightened Aggressive

Health Condition good - mild Heart good Hearing good

** Mental Condition good Outdoor Knowledge poor - has camped a lot

Will answer to whistle or call? may not Right or Left Handed Left

Familiar with Country in which lost? no Date Lost 10/10

Time Lost last seen 1530 Ever Lost Before? yes - 6 years ago

Plans of Lost Person return to car at Butte lake

Reported by Dr Austin Smith Relation Father

Location of Reporter Butte lake

* pack contains red down jacket, fiber-filled sleeping and some dried apples

** has dyslexia
1. Rainbow Lake
2. Under Cone Trail
3. Butte Lake Camp
ASSIGNMENTS

1. Appoint individuals in your group to fill the functions you feel are needed in managing this incident. Delegate/distribute the workload to achieve your assignments as efficiently as possible.

2. Using the statistical search area as a starting point, delineate your actual search area using subjective and deductive reasoning methods. You must have a piece of real estate (the search area) completely encircled by a line on your map.

3. Segment your search area into manageable segments with well defined boundaries.

4. Using the Mattson consensus method, assign an initial POA value to each segment within the search area, and to the probability that the subject is not in the search area.

5. Develop 3 to 5 incident objectives for the first 12-hour shift (operational period). These must be written and agreed upon by all members of your group.

6. Based upon your objectives, develop a resource order that will allow you to accomplish these objectives. Use the formula POA x POA = POS as a tool to help you determine the most effective and efficient use of your resources for this operational period.

7. Apply your resources to the field according to your plan. The instructor will then give you the actual POD's for each resource in each segment.

8. Determine the POD\(_{cum}\) for each segment at the end of the operational period.

9. Compute the new POA for each segment based upon the POD\(_{cum}\).

10. Using the new POA and the POD\(_{cum}\), develop incident objectives (3 to 5) for the following operational period.
MT. CLARK SEARCH
Yosemite National Park
October, 1986

Mt. Clark is 11,500 feet high and is situated at the north end of the Clark Range. It is generally considered a pretty mountain, visible from many areas of Yosemite National Park. Its summit offers a panoramic view of much of that part of the central Sierra Nevada. Two scrambling (free climbing) routes ascend the peak from the west -- one is rated Class 3 (steep, but easy climbing, requiring the use of the hands, but not requiring a rope). The other is rated Class 4 (not particularly difficult climbing, but a rope should be used). The subject is considered to be a "scrambler" and has attempted to climb Mt. Clark on at least one other occasion.

SITUATION: It is Saturday, October 18th. A supervisor at the park's concession has reported to security that one of the company's employees, Michael Kalantarian, has been absent from work for the past three days. His concern is raised because Michael has had an excellent attendance record all through the park's high tourist season. It is unlike Michael to miss work without calling in first.

You are the Ranger in charge of search and rescue. This information is provided to you by the concession Security Office. The reporting party, Mr. Greene, the concession supervisor, is still at the Security Desk. What action do you take on this missing person report?
KALANTARIAN SEARCH RESOURCES
Yosemite National Park

Sunday, October 19, 1986
Trackers - 20
Dog Teams - 3
Ground Teams - 10 (2 per ea.)
Radio Relay - Mt. Clark Summit
Spike Camp - Mono Meadows Trail (So. Mt. Starr King)
Helicopter - 1

Monday, October 20, 1986
Trackers - 20
Climbers, Technical - 6
Dog Teams - 4
Ground Teams - 10 (2 per ea.)
Trail Blockers - 4
Helicopters - 3

Tuesday, October 21, 1986
Same as October 20, 1986
plus
1 added helicopter with FLIR
1 CHP helicopter H-42

Wednesday, October 22, 1986
Same as October 21, 1986

California Mutual Aid Resources
California Office of Emergency Services
California Highway Patrol
California Youth Authority (MPS)
Bay Area Mountain Rescue Unit
California Explorer Search and Rescue Team
China Lake Search and Rescue Team
Sierra Madre Search and Rescue Team
Wilderness Finders (WOOF)
Tuolumne County Search and Rescue Team
El Dorado County Search and Rescue Team
Altadena Search and Rescue Team
California Rescue Dog Association (CARDA)
California Civil Air Patrol
California National Guard

Yosemite National Park Contractors
Aris Helicopters
Rogers Helicopters
Horizon Helicopters

Federal Government Resources
U.S. Marine Corps Det. (Pickle Meadows, CA)
U.S. Air Force Rescue Coordination Center
National Park Service
Mr. Greene:

If interviewed, Mr. Greene could provide the following information:

GENERAL DESCRIPTION OF MICHAEL KAYE

White, male, adult.

Age 30, height 5 ft. 11", dark brown hair, clean shaven, lt. complexion 156 lbs.

Employed by the Yosemite Park and Curry Company for past two years.

Appears mentally stable; likes own company; neat in appearance.

Good physical condition but occasionally complains of back problems.

Subject was supposed to return to work Thursday after regular two days off.

Mr. Greene reported him missing today, SATURDAY.

Michael Kaye has a friend, Margaret Colvin, also a concessionaire employee.
Margaret/Mitchell Colvin:

If interviewed, Colvin could provide the following information:

On Tuesday October 14th at approximately 1200 noon, Colvin drove Michael to the Mono Meadows trailhead just west of the Buena Vista trail; hiked with him on the Mono Meadows Trail for the first few miles.

Along with description of Michael, Colvin can provide information on clothing and equipment he wore or carried. He was last seen wearing the following:

- Purple knitted or Patagonia style zip-up sweater
- Blue down filled parka with hood
- Navy blue bunting pants
- Blue knit cap
- Leather boots (color unknown) size 9 1/2, likely vibram sole
- LOWA blue internal frame pack

Pack contents:
- Green North Face 2-man dome tent
- Grey or khaki rain parka
- Dark blue 3-season sleeping bag
- Backpacker's stove
- Flashlight
- Pentax 35MM camera
- Other sundry items

Michael does smoke marijuana on a regular basis; was carrying marijuana with him on October 14th.

Michael has been lost before on a Sierra trip in 1985.

Usually carries more food than needed for a trip.

An avid cross country traveler, prefers to stay off trails; likes to use map and compass.

Colvin is probably the last person to see Michael after he was left on the trail. His probable last place seen was in Section 10, T3S, R22E on October 14th.
MISSING

MICHAEL KALANTARIAN
White, Male, 30 years old, 5'11", 156 lbs
Brown hair, Brown eyes; wearing purple zip-up sweater,
Blue down parka, Blue bunting pants, Blue knit cap
Last seen on the Mono Meadow Trail headed to Mt. Clark
On Tuesday October 14th

IF YOU HAVE SEEN MIKE
Or were in the area—whether you saw him or not
Or may have information relating to his whereabouts
Contact YOSEMITE SEARCH & RESCUE
At 372-0217 or 372-0289
PRINT UPDATE

KALANTARIAN SEARCH

Description

Total Length: 12 ¼"
Ball Width: 4"
Heel Width: 3 ¾"
Heel Length: 3 ¾"
Pace: Toe to Toe 3!

Michael's regular shoe size is: 9½ B

This print closely matches several found at the new PLS. (On Mono Hwy. Trail)

PLS prints are from a standard 'Vibram' sole with 'MONTAÑA' heel blocks. PLS prints suggest only slight sole wear.
October 14, 1986

Clear skies during the day.
Cold at night; short snowstorm hits high country during night.
Daytime high - high sixties, low seventies.
Nighttime low - Mid thirties in the valley, below freezing at probable search
area(s) (17° F. reported at Tioga Pass [10,000 ft.] one night during
search.)

October 15, 1986

Skies remain clear; winds moderate; daytime temperature in 60s-70s;
cooler in shady areas. Nighttime temperature in mid to low 20s.

October 16, 1986

Unchanged - forecast indicates weather situation to continue unchanged
for next 5-7 days; high pressure off coast diverting any significant change
north of California.
Check Cabin loader
APB - Circulate Flyer at trailhead
NOTIFY LOCAL AUTHORITIES
Trail Blockers

Replan Sunday Forces
Hardy Team to Mt. Clark sign/track
B.C. permits - Vaxin Rino, see if new portable CP, Mono Meadows.
V. Merced Lake R.S.
V. Little Yosemite Valley B.C. Camp
V. Yosemite Jail/Hospital

Last lost report
Investigator
Profile -
Organize ICS

Communication available
Heli - overflight B-C-D-P-F-808
Drop off radio relay - manual
inserts

Spike Camp - Mono Meadows - manual

Team #1

Team #3

Team #4

Team #5

Team #6

CTA: Barely visible

10/24 08:30

#10 09/22

Day Team #1
4-2-trackers, Arcan B Drops
2
5

Day Team #2
2-tracker, Arcan B

Day Team #3
2-tracker, Arcan B Foot

Climb: Mt. Clark, N. Ridge
Night: Heli Exit
4-trail blockers
KALANTARIAN SEARCH
Yosemite National Park

Clue #1 Day 3 1000 hours

A ground crew working the northwest arete discovers a line of tracks at
(119° 26' 9" W/ 37° 42' 7" N). The team believe the tracks to be a few days old,
but they appear to match the suspect's print provided at the briefing.
KALANTARIAN SEARCH
Yosemite National Park

Clue #2 Day 3 1445 hours

The same ground team reporting the discovery of tracks earlier in the day found a baseball cap below the summit of Mt. Clark on the northeast slope; 119° 25' 41" W/37° 41' 40" N. The cap is well worn and has the Yosemite National Park logo affixed. The cap is found approximately 80-100 feet below the summit of Mt. Clark.
This print was located by investigators on October 20, 1986 after a cap was found at the base of the northwest arete. In the photo Kalantarian is wearing an apparently identical cap.
A single leather boot, similar to the subject's, is found at 119° 26' 30" W/37° 41' 32" N by a ground team at approximately 1200 hours. The sole pattern of the boot matches the print provided to all searchers at the briefing.

Within 15 minutes of finding the single leather boot, a dog team finds the subject's pack hidden in rocks at 119° 26' 56" W/37° 42' 37" N. The pack was about 1 1/4 miles north of the boot find on the northwest ridge leading to the summit.
KALANTARIAN SEARCH
Yosemite National Park

Conclusion

At 1322 hours, the same ground team which found the boot discovered marks in the dirt that looked like something had been dragged west (downhill) from the boot's location. Hearing this information on the search radio frequency, a nearby team picked up the same track further downhill. At 1348 hours, this team found Michael Kalantarian. His location was 119° 27' 53" W/37° 41' 40" N, approximately 1 3/4 miles west of Mt. Clark in the Clark Fork Drainage.
KALANTARIAN SEARCH
Yosemite National Park

Summary

Michael Kalantarian was due at work on Thursday and he was reported overdue on Saturday afternoon. At that time, a major search was started. Sunday's efforts focused on putting ground teams into the PLS, searching with dogs and trackers in the drainages on the west slope of the Clark Range, and aerial search of the crest of the Clark Range.

On Monday, teams continued searching the drainages on the west and north sides of Mt. Clark. Dog teams were sent along the northern rim and southern perimeter of Merced Canyon. Tracks on the northwest arete and a baseball cap were found on the northeast slope of the summit. These clues were found by a ground team. The tracks were found at mid-morning and the cap in the late afternoon. The finding of the cap lead investigators to the discovery of a photograph showing Kalantarian wearing a similar cap. The clue, with known hair samples, was dispatched by air on Tuesday morning (Day 5) to a state forensic laboratory in Fresno for analysis.

Early Tuesday morning a FLIR equipped helicopter overflew the general area near the point where the cap was found. Results were negative. Shortly after noon a ground crew working down-slope and to the west of the mountain summit found a leather boot in good condition. The boot matched those worn by the subject. Within minutes, about one and one quarter miles north of the boot clue, a dog team found Kalantarian's pack hidden in rocks. The pack was found along the northwest ridge leading to the summit.

An hour later, the ground team that found the boot discovered marks in the dirt that appeared to be like something had been dragged west (downhill) from the location of the boot. Hearing the radio transmission concerning the drag marks, a nearby team picked up the same track further downhill.

At 1348 hrs., PST, Kalantarian was found by the leap-frogging team.
JOHNSTON SEARCH  
COCONINO COUNTY  
Assignment One

1. Organize in groups of 5 or 6. Assume you are with Coconino County Sheriff's Department.

2. Calculate the Search Urgency.  

3. Calculate the POA for DAY ONE (4/2/83).

4. Using the provided Resources List, request what you need, from Instructors.

5. Be prepared to report to all groups what Hasty Team actions you have taken.

6. Develop plan for DAY TWO (4/3).
SEARCH & RESCUE REPORT

Date, time occurred - day 04-01-83 0930 (Friday) Date & time reported 04-02-83 1400

Location of occurrence Supai - Havasu Canyon

Victim's name JOHNSTON, Don I.

Residence address 1806 Harriet Lane, Anaheim, CA Phone (714) 776-8616

Victim's call name "Don" Race-Sex W/M age 49 Ht. 6-2 Wt. 165

Hair Red Eyes Blue Glasses Yes Contacts -- Jewelry --

Hat/cap Brown Shirt Brown Dress -- Coat Vest Pants Brown

Shoe type Boot Condition OK stockings Yes

Other clothing Dark Brown Backpack

Food Poss. Matches No Knife Unknown Compass No Fire Arm No

Other Items Yellow rain poncho - Backpack - Womens Clothing

Health conditions Lower back problems Recent mental condition Good

Intended activity Hike out of Havasu Canyon

Outdoor knowledge Novice Area familiarity Vague Ever lost before No

Date and time to return 04-01-83 1600

Next of kin Virginia Johnston relationship Wife Location Anaheim, CA

Phone (714) 776-8616

Witness' name ERICSON, Don

Residence address Long Beach, CA Phone

Occupation ______________ Race-Sex W/M Age ____ DOB ____________

Business Address ______________ Business Phone ____________

Witness' name JUDD, Glen

Residence Address 336 E. Smith St. Long Beach Phone (213) 428-6389

Safeway

Occupation Maintenance Race-Sex W/M Age 35 DOB ____________

Business Address 12200 Bellflower Blvd, Downey CA Bus. Phone (213) 922-9299
ASSIGNMENT:

Approximately 1400 hours on 04-02-83, I was contacted by Deputy CARDANI and advised of a possible search in the Supai area.

INFORMATION:

Approximately 1500 hours I arrived at the Williams Substation office and met with Deputy CARDANI.

I was advised that two male subjects from a church group hiking in Havasu Canyon were lost and some search efforts were already being conducted by the other members of the group.

The two subjects were described as:

1. Don JOHNSTON white male age 45 from Anaheim, CA.
2. Glen JUDD white male age 35 from Long Beach, CA

BACKGROUND INFORMATION:

The group was from the First Church of the Nazarene from the Long Beach, California area. The group consisted of seventeen members both male and female in their 20's, 30's, and 40's. The group's leader was Don ERICSON.

From information received the group had driven from California to Grand Canyon Caverns which is located 60 miles south of Havasu Canyon on March 27, 1983. From this point several of the vehicles took the group to Hualapai Hilltop which is the trailhead for Havasu Canyon. The vehicles were left at this location on the morning of March 28, Monday. The seventeen member group then backpacked into the canyon and went to Supai Village on the afternoon of March 28. The next four nights were spent in Supai Campgrounds.

On Friday morning, April 1, the group left the campground and went to the cafe in Supai Village. Several of the members ate breakfast and then planned to hike out to Hualapai Hilltop.

Apparently, due to the weight of some of the packs, some of the group's members hired a packer to carry out some of the packs on mules. Because of this, some of the group's members took the heavier objects from their packs and transferred them to the packs being carried out on mules. As a result of the transfer some of the members ended carrying backpacks other than their own.

JOHNSTON was reported to be carrying the pack belonging to Carol DRISCOLL. By the time the actual search began Carol DRISCOLL had already left the area enroute back to California. Before leaving she advised other group members that her backpack was a brown nylon material "BOLT" brand with an internal frame. The contents consisted of various items of her clothing, a ski vest, a yellow plastic rain poncho, two flashlights (one did not work very well), a sleeping bag with a blue nylon shell was tied to the pack, no matches or other fire starting devices were in the pack, some water was available in the pack. There were several granola food bars also in the pack.
BACKGROUND INFORMATION CONTINUED:

Approximately 0930 hours the group was preparing to leave the cafe in Supai Village. Apparently JUDD and JOHNSTON left later than the rest of the group and were walking with one another.

About one mile south of Supai Village there is a fork in the trail near Havasu Springs. The right fork in the main trail leads to Hualapai Hilltop. The left fork is called TOPACOBA trail and is the old main trail into Havasu Canyon. At the fork there is a sign indicating the main trail, however, this sign can easily be missed by hikers.

The Topacoba Trail leads from Havasu Springs south into the main Canyon, Cataract Canyon. The trail stays in the bottom of Cataract Canyon for about 2½ miles and travels in a primarily southeast direction. At this point, Rattlesnake Canyon and Lee Canyon meet Cataract Canyon from the east. Cataract Canyon continues in a southeasterly direction. Topacoba Trail then turns east and enters Lee Canyon eastward. The trail stays in the bottom of Lee Canyon for about four miles before coming out at Topacoba Hilltop. Topacoba Hilltop can be reached by vehicle by turning left at Moqui Lodge on Highway 64 in Tusayan Village and traveling westbound on Forest Service Road #328 for 33 miles.

From the information available, JUDD and JOHNSTON continued on Topacoba Trail for several miles.

The other members of the group subsequently reached Hualapai Hilltop and prepared to leave in their vehicles. They waited for JUDD and JOHNSTON until approximately 1600 hours before Don ERICSON and three other male members of the group (Charlie, Chuck, and Ty) went back down the trail to look for them.

Bureau of Indian Affairs (B.I.A.) officers in Supai Village were notified and B.I.A. Officer PACHECO assisted ERICSON'S group in attempting to locate JUDD and JOHNSTON.

Ty and Chuck came out of the canyon and stayed in Ty's camper at Hualapai Hilltop to wait for everyone to return.

On Saturday PACHECO, Charlie, and ERICSON continued to look for JUDD and JOHNSTON.

Approximately 1100 hours ERICSON and his group located JUDD in Cataract Canyon a short distance up Lee Canyon on the Topacoba Trail.

JUDD was then taken to the fork of Topacoba Trail and Supai Trail and waited there until some of the members of the group could assist him in hiking out. JUDD later that afternoon walked out to Hualapai Hilltop and was taken to the Caverns Inn. This information concerning locating JUDD could not be distributed to everyone until much later in the day.
MISSING BACKPACKER

DONALD L. JOHNSTON
Age 49, height 6 feet 2 inches, weight 165, graying reddish-brown hair, blue eyes, wearing glasses, long thin face, slender build.

Believed to be wearing faded blue jeans, plaid flannel shirt, possibly a gray Levi ski vest, tan cloth hat with brim.

Carrying a cocoa brown internal frame backpack - Dole brand.

Last seen leaving SUPAI about 9:30 a.m. Friday, April 1, destined for HUALAPAI HILLTOP. It is believed he missed the trail and could be lost in the vicinity of CATARACT, LEE, RATTLE SNAKE or PUTESOI Canyons.

If you see this man, please contact Coconino County Sheriff's Department search headquarters at Grand Canyon Caverns, (602) 422-3223 or Bureau of Indian Affairs Law Enforcement Officers at SUPAI.

CCSD: DR# 3-0483-0633
EMS: 83-266
RESOURCES LIST

Coconino County Sheriff's Search & Rescue
Flagstaff
5 man-trackers
Williams 2-4 WD

Grand Canyon 2 guides

Bureau of Indian Affairs - Supai
3 deputies -
1 man-tracker

Helicopters
Dept. of Public Safety - Jet Ranger
Arizona Nat'l Guard - 3 UH-1 "Hueys"
Madison (private) - Jet Ranger

Civil Air Patrol - Fixed Wing
Leitrim CR555

ARRS/RCC
Airscenting Dog Teams via USAF HC-130
(in Calif)

Sheriff's Dept.
10 deputies / 1 secretary
C.P.

Section 3 Airspace FAA 911

Uses: Volunteers, Tech, Team, Medical

Halo: Fuel, Logistical, Relief, Replace

Backpack: Talker / him

Grand Search Area
Coconino County Sheriff's Department
Lost Persons Questionnaire / Check List

Date 04-02-83

EMS# 83-266 DR# 3-0483-0633 Officer Cardani

Data Taken By AHSING, Doran by: Phone , in person X
          S.O. 

Name of missing person Don L. JOHNSTON

Work Address 1806 Harriet Lane, Anaheim, CA Local Phone (714) 776-8616
Home Address 1806 Harriet Lane, Anaheim, CA Home Phone (714) 776-8616
Nicknames NONE Aliases NONE
Age 49

Physical Description: Height 6-2 Weight 160 Build Slender
Hair-color Grey Length Short Sideburns No
Beard: NO Balding? Yes
Eye color Brown
Facial features/shape Thin (pointed Chin) Complexion Ruddy
Any distinguishing marks/scars, Etc.? NONE
Race White

General Appearance Days growth of beard

Complete and detailed answers to questions needed to identify clues as found. Put "None", "NA (not applicable)", or "unsure" in blanks as appropriate.

Clothing: (Diagram of Sole)

Shirt/sweater style Long Sleeves color Tan
Pants style Long color Tan
Jacket style Long color Tan
Rain gear style Poncho color Yellow
Shoes style Hiking Boots size 9 or 10
sole type smooth
Is a sample of sole type available? NONE

Hand gear style Unknown color NONE
Gloves style Unknown color
Equipment:

Glasses  regular/sun  Regular  style  Plastic/White Nevhal
Any extra clothes/shoes?  No/Brown Tennis Shoes (NIKE)
Scent articles available?  Where  Internal
Pack  Frame  style  Nylon  brand  Color
Tent  style  brand  Color
Sleeping bag  style  Nylon  brand  color  Red/Blue
Food  what  brands  amount
Water  canteen style  plastic  amount  2 quarts
Flashlights  matches  Yes  knife  No
Map  Unknown  compass  No
Ice axe  No  brand  covers?
Snow shoes  type  brand  binding type
Tour skis  brand  length  color
binding type  binding brand
Ski wax  type  brands  color
Ski poles  type  length  color
brand
If rental equipment, rental markings?
Ropes/hardware
Fishing equipment  brands
Camera  Instamatic 460  Pocket  brand  Kodak
Money  Yes  amount  Unknown  credit cards  Unknown
Firearms  No  type  brand  ammo
Trip Plans:

Going to ___________________ via ________________

Purpose ______ Hike into Havasupai ___________________

How long ___ 4 days _____ How many in group ___ 17 ________

Group affiliation ______ Church____ transportation ____ Van_____

Started at ______ Hilltop ______ when ____ 04-01-83 _________

Car located at ______ Hilltop ______ cond. ________________

color ______ year ______ make ______ body style ______

Lic. # _______ Lic. year _______ State ________

Vin/other identifying characteristics _______________________

________________________. CB? ____ style ______ brand _______

Pickup/return time ___________ where __________________

All in Group

Name Don ERICKSON _______ address ______ 3952 San Bonito Ave. Los Alededo ___

Phone (213) 596-5670 ______ Car License ________________

Name Doren AHSING _______ address ______ 10242 Barbara Anne St. Cypress ______

Phone (714) 327-4762 ______ Car License ________________

Any alternate plans/routes/objectives discussed?

Last Seen Details:

When 04-01-83/0930 hours Where ___ Supai Village (Restaurant) ______

By whom ______ Chris Price & Danny Hilton Present ____________

if not, location ____________________ Phone ___________

Weather ______ Sunny/Clear __________________

Going which way ______ North _____ How long ago _______

Special reason for leaving? _____ No ___________________

Unusual comments upon leaving? _____ No ___________________
Experience

Familiar with area ______ No____ How recently ____________________

If not local - what other areas of experience ______ Prior Hikes ______

Taken mountaineering classes ______ No____ where ____________________

When ____________________

Taken First Aid training Unknown ______ Where ____________________

When ____________________

Been in Scouts ______ No____ Where ______ When ______

Military service? ______ Unknown ______

How much overnight experience? ______ Some ______

Ever been lost before? ______ No____ actions ____________________

Ever go out alone? ______ Yes ______

Stay on trails or go cross country? ______ Cross country ______

How many long trips before? ______ One ______

If not, regular hiker-gen. athletic interests & ability ______ Tennis ______

Contacts Person Would Make Upon Reaching Civilization:

Home address ____________________

Phone ____________________ Anyone home? ______

Local contact? ____________________ Phone ____________________

Friends ____________________ Phone ____________________

Health - General Condition:

Any physical handicaps ______ None ____________________

Any known medical problem ______ None ____________________

Knowledgeable Doctor ______ Phone ____________________

Any known psychological problems ______ No ____________________

Knowledgeable person ______ Phone ____________________
Taking prescription medication ______ No __________________________

Doctor ____________________________

Consequences of loss ____________________________

Amount carried ____________________________

Eye sight without glasses ______ Poor _____ spare? ______ No ______

Actions Taken so Far:

By: Friends/family - when _________ results __________

Sheriff when _________ results __________

Missing persons report filed - when _______________________

Where __________________________

All points bulletin issued - when _______________________

Authority __________________________

Personality Habits:

Smoke _______ How often? ___________ What ___________

Brand __________________________

Drink _______ brand __________________________

Drugs __________________________

Hobbies/interests - fishing, flowers, climbing, photography:

Nature in general __________________________

Does person work for spare money? ______ Unknown __________

Outgoing or quiet; likes group, or along? ______ Outgoing __________

Evidence of leadership ______ No __________

Ever been in trouble with law? ______ No _______ Now? __________

Hitchhike often ______ No ______ accept rides __________

Feelings toward grownups ______ Unknown ______ hippies _______

Any current family/girl friend problems? ______ No __________
Religion __ Nazarene ___________ Serious __ Yes ____________
What does person believe in? _Being fair __________________
What does person value most? ___ Wife, Son ________________
Who is person closest to: in family ___ Wife ________________
in general ___ Wife ________________
Where born and raised? ________________________________
Any history of depression, running away? _No ______________
Status in school _____________________________ draft __________
Who last talked at length to person? ___ Glen JUDD __________
Where Havasupai __________ subject Getting out ___________
Any recent letter? _No ________________________________
Give up easily or keep going? _Keep going ________________
Will person hold up and wait or keep moving? _Keep moving __________

For Children:
Afraid of dogs? ____________ Horses _______________________
Afraid of dark? ____________
What training regarding what to do when lost? ________________
What are actions when hurt? Cry? Carry on? ________________
Talk to strangers; accept rides? __________________________
Active type or lethargic? ________________________________

For Groups Overdue:
Any personality clashes in group? ________________________
Any strong leader types not actually the leader? ______________
What is competitive spirit of group? _______________________
What would be actions if separated? _Very calm ____________
Any persons especially close friends? _AHSINGS ___________
What is experience of leader and rest of group? _Experienced Hiker_
Family - To Prevent Press Problems:

Father's occupation ________________________________

Parents separated or similar problem ________________

Family's desire to employ special assistance __________

Name address, phone of father/mother/husband/wife/son/daughter to notify if found in good condition: (give most appropriate kin for information or contact when found)

Name __________________ Address ____________________

Phone ________ Relationship _____

Person to notify if found in very poor condition or dead: (should be friend, relative, or minister of next of kin)

Name __________________ Address ____________________

Phone ________ Relationship _____

Photograph(s) If available.
Assignment Two

1. Reassess POA; change it if you wish.
2. Prepare to discuss rationale for change.
JOHNSTON SEARCH
(added information)

DPS Helicopter is down for required maintenance. Airscenting dogs were diverted to look for 8-year old boy in Chiracahua Mountains of Cochise County. He was found deceased so they headed back to Flagstaff in the Air Force C130. AZNG Huey Coyote 12 is picking them up at Flagstaff at 1330. Coyote 14 reports fuel trouble - made emergency landing at 1430. Coyote 12 is going to pick up the crew. Coyote 12 arrives at Search Base at Grand Canyon Caverns Inn (60 miles from PLS) at 1630. Storm clouds and approaching dark and no backup helicopter lead to decision to not put dogs in till tomorrow.

Little helicopter searching was accomplished except for side canyons of Cataract and Havasupai. Trackers continued up Cataract and Moqui Trail - no results.

Johnston's family and Church group offer to charter a private helicopter. AZNG is sending Coyote 16 to replace 14.

Weather: same as today.
Assignment Three

1. Prepare plan for DAY FOUR (4/5).

2. Assess Urgency factor.

3. Should you accept the family's offer of a helicopter? If so, any conditions? If not, why?
Charter copter with Deputy has found sleeping bag lining on a bush on Sage Brush Point.
DAY ONE
Saturday - April 2, 1983

Approximately 1400 hours I was advised by Deputy CARDANI #123 of a possible search developing in the Supai area. At 1500 hours I arrived at the Substation office in Williams and met with Deputy CARDANI and Warren LUDWIG from the Williams-Grand Canyon Search & Rescue.

They advised me that Neil JACKSON from the Bureau of Indian Affairs (B.I.A.) in Peach Springs had telephoned this office several hours earlier regarding two missing hikers in Havasu Canyon.

Approximately 1530 hours I requested the Department of Public Safety Helicopter (Ranger 31) to fly the area in an attempt to locate the two individuals.

1610 DPS Ranger 31 is in the air and enroute to the area.

1615 I telephoned Neil JACKSON, BIA, at 769-2433 and obtained following information: Victim; Two white males possibly took the Topacoba Hilltop Trail. They were from the Don ERICSON Party. ERICSON and three others from his party are searching the area with two BIA officers.

1620 Neil JACKSON, BIA, telephoned me. Victim; Glen JUDD has been located and is alright. The other victim, Don JOHNSTON, is still missing. JOHNSTON is 45 years old.

1625 Sheriff RICHARDS is notified and briefed on efforts thus far.

1652 I had the Flagstaff dispatcher obtain a Division of Emergency Services (EMS) number 83-266. I requested a DR# for a Search - 3-0483-0633.

1700 I telephoned Corporal LUCKESEN at the Grand Canyon and had him notify the National Park Service.

1725 WEATHER FORECAST - Per Flagstaff Dispatcher obtained through National Weather Service - Flagstaff:
SATURDAY: APRIL 2 - Partly cloudy and breezy
Low mid 40's
SUNDAY: APRIL 3 - Cloudy and Breezy
High - upper 50's
Low - mid 30's
Winds 15 to 25 MPH

PLANS FOR DAY TWO - SUN. APRIL 3

1730 Plans were made for Sunday

1. Ranger 31 requested to continue search at first light. Specific area to be searched is Lee Canyon and Topacoba Trail.
2. Lt. DRISCOLL and Deputy CARDANI to go to Caverns Inn and conduct extensive interview with JUDD.
3. ATTEMPT TO LOCATE issued by teletype to all Arizona Law Enforcement Agencies regarding victim, JOHNSTON, advising if located, to contact this department. (Teletype sent 04-02-83, 1740 hours).
DAY TWO
Sunday April 3, 1983

0500 Lt. DRISCOLL and Deputy CARDANI enroute to Grand Canyon Caverns.

0555 Lt. DRISCOLL and Deputy CARDANI arrive at Grand Canyon Caverns.

0600 INTERVIEW

JUDD, Glen - at motel room at the Caverns Inn. Also present were Charles and Doran ASHING.

Deputy CARDANI and myself then went to JUDD's motel room and awoke JUDD. Charles and Doran ASHING were also staying in the same room.

We questioned JUDD regarding the events of the past two days. At this time JUDD appeared confused and somewhat disoriented. He did not appear as though he was thinking clearly as he related the events of the past two days. It appeared that the chronological chain of events was not correct.

JUDD basically stated that he and JOHNSTON had somehow taken the wrong fork in the trail in the bottom of the canyon on Friday morning. They continued walking all day before realizing they were lost. They spent the night lying on the ground. Neither of them slept in the sleeping bags they had. In the early morning when JUDD awoke, JOHNSTON was gone. JUDD stayed in the general area and was located approximately 1100 hours by Don ERICSON. JUDD could not remember anything specific about talking with JOHNSTON prior to him leaving. We requested JUDD to describe what JOHNSTON was wearing when they became lost. JUDD along with the help of the ASHINGS' described JOHNSTON as being 6-2, 165 lbs wearing glasses. He also was wearing light brown kakai shirt, pants and hat. He was carrying a brown backpack. They all described him as wearing army combat type boots with a completely worn out sole pattern, indicating the sole was completely smooth leaving no markings other than the plain sole print. The size was estimated to be 10 to 10½. No further information or description could be obtained at this time.

0700 Lt. DRISCOLL and Deputy CARDANI arrived at Hualapai Hilltop.

0700 Myself and Deputy CARDANI arrived at the Trailhead at Hualapai Hilltop and met with Ty STURGEON and Chuck DRESHER, two members of the Don ERICSON Party. We then conducted an informal interview with them. They advised that on Friday afternoon when JUDD and JOHNSTON did not a rive at Hualapai Hilltop, that they along with Charlie ASHING Jr. and Don ERICSON went back down the trail to look for them. Later in the evening Ty and Chuck walked back out and stayed in Ty's vehicle at the trailhead.

At this time we also met Officer Henry TANORI from the B.I.A. Officer TANORI had been assigned by Neil JACKSON to assist our agency in the search. TANORI advised us that B.I.A. Officer PACHECO was assisting Don ERICSON in the search in the Canyon. Officer PACHECO is an experienced tracker and was quite familiar with the entire canyon.
DAY TWO
Sunday April 3, 1983

0900 The DPS Ranger 31 landed at Hualapai Hilltop with Officer PACHECO. Ranger 31 then went to Grand Canyon Airport to refuel and then continue the search.

We then interviewed PACHECO concerning the search. He stated that he and Don ERICSON had located JUDD the previous morning in Cataract Canyon at the confluence of Lee and Rattlesnake Canyons. Also near this location they found a green colored canteen belonging to JOHNSTON along with a note written by JOHNSTON to JUDD. The note stated that JOHNSTON was leaving the canteen with some water for JUDD and that he (JOHNSTON) was going to the campground for more. PACHECO stated that he and ERICSON followed a smooth sole track into Lee Canyon on Topacoba Trail all the way to the trailhead at Topacoba Hilltop. From the Hilltop, the tracks led to an abandoned cabin a short distance away. PACHECO lost the tracks upon reaching the cabin. PACHECO AND ERICSON then returned back down Topacoba Trail and spent the night (Saturday) at the Ranger Station in Supai Village.

1200 Don ERICSON and Charlie AHSING Jr. arrived at Hualapai Hilltop. We interviewed them and they felt that JOHNSTON had walked out Topacoba Trail through Lee Canyon and came out of the Canyon at Topacoba Hilltop.

1200 We requested that Ranger 31 fly the area of Topacoba Hilltop and Forest Service road #328 which leads from Topacoba Hilltop to Grand Canyon Village checking the roadway and any cabins or structures along the way.

1400 Deputy CARDANI and myself returned to Grand Canyon Caverns and established a Command Post at the Caverns Inn Motel.

1630 Sheriff RICHARDS briefed by phone.

1700 PLANS FOR DAY THREE (Tentative plans for good weather)

1. Have three air scent dog teams placed at point last seen (PLS) by 0700 hours this point, one team would work Topacoba Trail east. One team would work Cataract Canyon southward checking side canyons east. The third dog team would work Cataract Canyon southward checking all side canyons west.

2. Four trackers would be placed at the PLS to back up and assist the dog teams by 0700 hours.

3. An additional helicopter from the Army National Guard would be requested to transport the trackers and dog teams from Grand Canyon Caverns to the PLS.
4. A four wheel drive unit would travel from Grand Canyon Village on F.S. 328 to Topacoba Hilltop checking side roads and other probable areas.

5. The DPS helicopter to fly a grid search from Topacoba Hilltop toward the south.

PLANS FOR DAY THREE (Tentative Foul Weather)

1. All plans would remain the same with the exception of utilizing the two helicopters.

2. All trackers and dog teams would be taken by vehicle to Hualapai Hilltop. From there they would walk down the trail and back up to the PLS to initiate their part of the search.

* In the event the trackers and dog teams were required to walk into the canyon, this would set back the time table at least eight hours and would greatly reduce the effectiveness and duration of all those concerned.

1700 Sgt. WHITTED #58 telephoned and request was made for additional helicopter, trackers and dog teams.

1740 Per Sgt. WHITTED - five trackers would be at Grand Canyon Cavers at 0700 hours on 04-04-83.
Trackers were:
K. Brain
D. Kula
H. Fushlen
T. Harrison
K. Purcel

1850 Lt. DRISCOLL and Deputy CARDANI arrive back in Williams.

1900 Sgt. WHITTED telephoned and advised:
Dog teams cannot arrive at Caverns until 1000 hours. 04-04-83.

1900 Civil Air Patrol (CAP) to conduct "Fly over to look for possible campfire."

1905 Flag Dispatch per National Weather Service
WEATHER REPORT
Sunday night - Colder with decreasing winds
Canyon Rim 18-24 degrees
Bottom 41 degrees
Monday - Scattered snow
Highs - Rim - 40 degrees
Bottom - 55 degrees
2015  DPS Ranger 31 crew telephoned and advised me of the areas they had flown on Sunday afternoon:

Lee Canyon
Cataract Canyon to Supai Village
Supai Village back up Cataract Canyon
Lee Canyon again
F.S. Road #328 from Topacoba to Grand Canyon
All buildings near or adjacent to F.S. #328
To Grand Canyon Airport for fuel
Down Lee Canyon into Cataract Canyon
Rattlesnake Canyon and the next canyon south
*No Plateaus were checked.

DAY THREE
Monday 04-04-83

0500  Five man tracking team from Flagstaff Search and Rescue enroute to the Command Post.

0600  DPS Ranger 31 enroute to search area. Lt. DRISCOLL and Deputy CARDANI enroute to Command Post.

0700  #32 and #123 arrive at Command Post.

0720  I met Virginia JOHNSTON, Wife of victim, and briefed her on efforts thus far.

0730  Conducted briefing and made assignments to tracking teams. Yellowflagging to be used exclusively by ground units. All clues will be flagged and marked. Clues will be sent to Command Post if possible.

0745  Just learned that helicopter fuel is available at Grand Canyon Caverns in a truck parked on the airstrip. Truck belongs to Grand Canyon Helicopters.

0820  DPS Ranger 31 pulled off search due to maintenance requirements.

0820  Another National Guard Helicopter is requested as soon as possible.

0826  Additional personnel from Williams Substation requested - Secretary Connie COX #1615, Deputy AUGENSTEIN #73 along with typewriter and various departmental forms.

0853  National Guard Helicopter enroute from Grand Canyon with a mechanic to operate fuel truck parked behind the Caverns Inn.
DAY THREE  
Monday 04-04-83

1010 Deputy CARDANI assigned to conduct "Field Communications" at Panya Point which overlooks Cataract Canyon.

1012 I requested the Infrared Equipment and team from Fort Huachuca.

1012 Civil Air Patrol has one plane committed to the search. Can be used wherever needed.

1052 Sgt. WHITTED - One of the dog teams diverted to southern Arizona to a search for an eight year old boy.

1053 UPDATED WEATHER FORECAST
TODAY: Partly cloudy  
Breezy Winds to 35 mph  
10% chance of snow above 4,000 ft.  
TOMORROW: 20% chance of snow

1120 National Guard Helicopter lands at Caverns

1140 PLANS meeting for 04-05-83 conducted by Lt. DRISCOLL.

1240 Offer to fund additional private helicopter came from family of victim and church.

1245 WEATHER FORECAST
TODAY: Isolated snow showers in afternoon  
Rim - Mid 30's  
River - Mid 50's  
TONIGHT: Widely scattered snow showers  
Rim - Mid teens  
River - Mid 30's

1300 Trackers enroute to PLS in National Guard Helicopter (Coyote 14)

1330 Search for eight year old in southern Arizona ended. Dog teams diverted back to Flagstaff in a C-130 to rejoin two other dog teams. Tentative plans to have second Guard Helicopter transport three dog teams from flagstaff to Command Post.

1340 Two dog teams in Flagstaff.

1344 S&R LUDWIG assigned as observer in Coyote 14 enroute to search Cataract Canyon.
DAY THREE
Monday 04-04-83

1345  Per Lt. DRISCOLL - Tracking Team advised to return to PLS and establish a helicopter on or near as possible.

1346  National Guard Helicopter Coyote 12 lands in Flagstaff.

1506  Coyote 14 low on fuel - enroute to Command Post.

1520  Coyote 12 enroute Command Post with three dog teams.

1535  Approximately Coyote 14 developed mechanical problem and made emergency landing.

1550  Deputy RUSSELL #118 and S&R DAVIDSON at Topacoba Hilltop enroute Grand Canyon by four wheel drive and checking side roads.

1615  Madison Helicopter (Chartered by family) arrives at Command Post.

1625  Cpl. LUCKESEN #33 assigned to Madison chopper to control those areas searched.

1705  Command Post notified of status on Coyote 14

1730  National Guard Helicopter Coyote 12 enroute to pick up crew from Coyote 14.

1745  Coyote 14 able to land at Command Post.

1750  Coyote 12 lands at Command Post.

1810  Briefing
     Lt. DRISCOLL briefed Guard personnel and dog teams and made assignments.

* Unable to transport dog teams by helicopter to PLS due to approaching darkness and snow showers.

PLANS FOR 04-05-83 (Tentative good weather)

1. One dog team and one tracker to Topacoba Hilltop
2. One dog team and one tracker from PLS toward south in Cataract Canyon and all side Canyons to the east.
3. One dog team and one tracker from PLS toward south in Cataract Canyon and all side Canyons to the west.
4. Deputy RUSSELL and S&R DAVIDSON drive from Highway 64 to Anita Siding then to Moqui Trailhead checking all side roads.
5. Madison Chopper with #33 to fly grid search from Sagebrush Point northward.
6. Coyote 12 to transport dog teams to PLS by 0700 hours then fly grid search of Great Thumb Mesa.
DAY THREE  
Monday 04-04-83

1810  Briefing Continued

7. Coyote 16 to fly grid search of Sagebrush Point south.
8. 12 to 16 foot units to be broken into two teams and transported to Moqui Trailhead and WC Trailhead to work north until they meet dog teams. (Ground Team on standby only)
9. Have CAP conduct another "fly over" for fires or lights.

DAY FOUR  
Tuesday April 5, 1983

0552  Deputy CARDANI # 123 arrives at Grand Canyon Caverns C-P.

0600  Madison chopper enroute to assigned area. #33 on board.

0620  Lt. DRISCOLL, Deputy PALESKI #52 and Connie COX at Command Post.

ASSIGNMENTS:

Deputy Val PALESKI #52  Ground Operations
Deputy John CARDANI #123  Field Communications
Deputy Bobby AUGENSTEIN #73  Air Operations
Connie COX  Records
Sgt. Sam WHITTRED  Flagstaff Coordinator
Deputy Dave RUSSELL #118  4X4 at Grand Canyon
Cpl. Steve LUCKESEN #33  Commercial Helicopter

0630  WEATHER UPDATE
TODAY - High 40 degrees  Low 20 degrees
Continued cold, variable cloudiness to 4,000 feet
scattered rain or snow showers. No accumulation.
TOMORROW - Same

*0646  Deputy PALESKI telephoned church group member Norm HILTON in California - (213) 429-8248. HILTON advised that on Friday morning Victim, JOHNSTON, changed from boots to "Nike" tennis shoes described as Tan with dark brown stripe, sole is possibly black. JOHNSTON also possibly carrying aluminum walking stick.

0647  Replacement Guard Helicopter (Coyote 16) arrives at Command Post to replace Coyote 14.

0649  Deputy AUGENSTEIN and S&R LUDWIG arrive at Command Post.
DAY FOUR
Tuesday April 5, 1983

0700 All crews and teams briefed and received assignments.

0703 Helicopter delay - Coyote 12 unable to lift off due to frost - slight delay.

0720 Virginia JOHNSTON, wife of victim, interviewed and advised Don is a jogger. He has some lower back problems and has been seeing a chiropracter for 25 years.

0725 Coyote 12 enroute to PLS and Topacoba Hilltop with dog teams.

0745 Deputy CARDANI enroute to Panya Point to conduct field communications and relay operations for ground units in the canyon.

0732 Per Flag dispatch - 2 inches of snow at South Rim of Grand Canyon and still snowing.

*0733 Cpl. LUCKESEN telephoned Lt. DRISCOLL from Supai Village advised that at 0713 hours they had found a piece of red material tied to a bush with a strap and buckle from a backpack. White filler material also found scattered in the area. Also two arrows formed in dirt pointing in a northeasterly direction. Footprints also found about 10" in length. Sole design is small squares. #33 enroute back to check area.

0735 Dog Team one and tracker diverted from Flight to Topacoba Hilltop to Sagebrush Point.

0815 Request to Kaibab National Forest for ground to air portable radios.

0835 Coyote 14 enroute to Phoenix

0903 Backpack contents located by Coyote 12. Dog Team one on ground and following good trail.

0905 Grand Canyon Helicopters fuel truck arrives at Command Post.

0920 Coyote 12 lands at Command Post.

0926 Coyote 16 enroute Sagebrush Point to begin searching assigned area.

*0935 #33 LUCKESEN advised that they had located the victim, JOHNSTON, at 0915 hours. They were flying him to the Command Post.

LOCATED ON SAGEBRUSH POINT: Lat. 36 degrees 95' / Long. 112 degrees 63'
T 31N NE 1/4 Sec. 8
DAY FOUR  
Tuesday April 5, 1983  

1000  JOHNSTON arrives in Madison Chopper. Basically in good condition, but hungry and cold.  

1130  JOHNSTON taken to Kingman Hospital to be checked. Transported by Deputy PALESKI and Connie COX. Wife, Virginia also went.  

1215  All ground units (trackers, dog teams) returned to Command Post.  

1220  All search personnel at Command Post.  

1310  Debriefing conducted by Lt. DRISCOLL. JOHNSTON, PALESKI and COX still at Kingman Hospital.  

An interview with Don JOHNSTON was conducted by Deputy PALESKI and COX while enroute to Kingman Hospital.  

Due to the physical and mental condition of JOHNSTON, no indepth interview was conducted.  

It should also be noted that JOHNSTON stated when he was found that he had given up and was not going any further. It is probable that JOHNSTON would not have survived another 24 hours due to fatigue and the extreme temperatures in the area where he was found.
The post mission interview of Johnston failed to disclose why he decided to leave his companion at the canyon junction without waking him. He felt comfortable that he could make it back to the campground and return on his own. Though it cannot be 100% determined, his probable route took him up Cataract Canyon to Pasture Wash. He ascended the northeast rim of Sage Brush Point gaining about 1500 feet elevation. Sleeping bag cover was discarded and later found at the farthest northern point on Sage Brush Point near the 5600 contour indicator on the map. Pack contents were found near the section corner at 5727. Man-tracker and dog team tracked him for two miles into section 11 near the Moqui Canyon rim. Johnston was found by helicopter in the northeast quarter of section 8, about 3-1/2 miles west. He had finally quit walking. Probably would not have made it another night. Helicopters had passed over him twice -- once on DAY TWO, once on DAY THREE.

Learning Points

Investigation: Detailed interview of Judd and close friends did not occur early in the search mission. Only on the last day of the search did a call to one friend in Long Beach reveal that Johnston had given his boots away and was wearing Nikes.

Resources: Use of dogs in operations occurred later than ideal. Note: resources obtained from out of state.
PRE-COURSE EXAMINATION

1. Briefly define "preplanning" and describe why it is important.

2. List the five major organizational functions common to all search missions.

3. List at least four factors that must be considered in determining how urgent it is to respond to a lost person incident.

4. List four "clue finding" resources commonly used on searches.

5. When should the "investigation" phase begin, and when should it be terminated?

6. List three factors to consider in determining whether to suspend an unsuccessful search.

7. List three factors that you might use to decide where to start looking for a lost person.
8. When a person arrives in your office and reports an overdue hiker, list the three things you would do next, in the order you would do them:

9. Where would you call if you needed military resources or military transportation for "outside" resources?

10. What is the most important thing to accomplish following a search mission?

11. History of your area shows lost subjects are found at the following distances from the point last seen:

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What is the median distance for these cases?

12. Say you have sent a search team out to search a specifically defined area. The team comes back (subject has not been found); what question(s) might you ask the team leader to determine how effective his/her team was in searching the assigned area?

13. List four reasons why "search mission documentation" is important?
14. Who has investigative authority over a crashed commercial airplane?

15. How might a truffle become important in reducing the duration of a search mission?
FINAL EXAMINATION (SHORT FORM)

1. Briefly define "strategy" and "tactics".

2. List five methods used for search area confinement.

3. List and briefly define the four core elements of search and rescue.

4. List the three major categories of search resources.

5. Define each of the three TYPES of search tactics.

6. List the major techniques used to define (determine) the search area.

7. Using the probability of detection calculations, compute the POD for a 30 foot spacing interval.

8. Using the cumulative POD calculations, compute the POD final for three searches with the following POD's: POD 1 = 25%; POD 2 = 40%; POD 3 = 75%.

9. Using the "standard" data from Wartes' experiments, how much area can be searched by 80 searchers in 7 hours with a 70% POD final using two passes through the entire area.
TRAINING OPPORTUNITIES