



# Search Tactics

In The Field, Tactics Are What Works

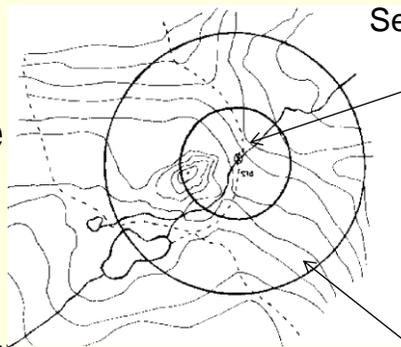
Tactics are how the search is actually carried out, who searches where, what types of searches are done and how many resources are applied to each area. For most searches, tactics are the domain of the Operations Chief and Operations Section at the Command Post. They involve the selection of search location and broad methods as to how the search should be executed. Once in the field, adjustment of tactics is up to the team leader.

# Initial Strategy

- PLS (visual based)

- IPP (can be clue or visual based)

- LKP (clue based)



Search area after 2 hours

Search area after 5 hours

There are several abbreviations you are likely to hear both during this training and in the field. **PLS** stands for Place Last Seen and identifies the last place someone actually saw the lost person. This location may change as the search progresses, particularly the investigation function of the search. The **PLS** is very time sensitive. As the illustration shows, double the time available for the lost person to travel and you significantly increase the potential area to be searched.

The **IPP** stands for the Initial Planning Point. This is typically the same as the PLS at the beginning of a search, but unlike the PLS never changes. Lost person behavior statistics are based on the IPP.

The **LKP** or Last Known Point has nothing to do with seeing the lost person and everything to do with locating clues left by the person including footprints, clothing and the like. These clues generate changes in probability and focus of search areas and efforts. There is usually no lack of potential clues on a search...the real problem becomes whether searchers will find a clue and then if the item found is a clue belonging to the lost person.

In the illustration above, if the center of the circle is the **PLS** you could have a pretty large area to search but if a clue that clearly belonged to the lost person is found by the pond shown it would greatly reduce the size of the search area.

# Probability of Detection

The probability (expressed as a %) that a subject or clue would have been located in an assigned area after completing a search.

- Size and coloration of the object being sought
- Experience-based subjective judgments
- Future strategy is based on the POD achieved in each area of the current search effort
- The over or under-estimation of POD may cause an area to be ignored or over-searched

**POD** stands for **Probability Of Detection** and is a term used to assess how likely a search team would have been in finding the subject had the subject been in the area they searched.

There are many factors that enter into establishing the **POD**, which is usually expressed as a percentage. **POD** is a post search assignment consideration. In other words, once a team has completed its assignment it provides an estimated **POD** to the Command Post (**CP**) during their debrief. Realistically, the **POD** will depend on several lost-person factors such as the size of the person, the color of the clothing, whether the person is likely to hide from searchers and environmental factors like terrain and weather. There are several ways for a team to establish the **POD**, and the primary factor is the experience of the team members. Sometimes the team leader makes the determination; other times the three or so most experienced searchers on the team do so; still again, the team leader may ask everyone's opinion and weigh it based on the individuals involved.

It is important to remember that search managers will base future assignments on the **POD** they are given. As the slide points out, error either way causes potential misdirection of limited resources.

# Lost Person Behavior

- Based on statistical data from 16,863 searches (Lost Person Behavior – Koester)
- Provides both potential strategy and tactics
- 41 Various Categories of lost persons
- Considerations include:
  - Age
  - Medical Conditions (including mental health)
  - Activity (hunting, hiking, etc.)

As has already been noted, statistical information gained from historic lost person behavior contributes heavily to the search strategy (where and when to search), and tactics (how to search).

The slide shows the three primary considerations involved in determining lost person behavior. Information provided includes average distance from the IPP (which we have already seen), likelihood of hiding from searchers, likelihood of responding to calls, and probability of travel uphill or downhill.

Reference Lost Person Behavior by Robert Koester [www.dbs-sar.com](http://www.dbs-sar.com)

# Passive Search Methods

- The search resource is stationary

- **Attraction**
- **Containment**
- **Track Traps**
- **Listening Posts**



There are both passive and active methods of searching, first we will address passive. Passive methods are those where the searcher is stationary, at least for the most part. Any of these methods are appropriate for supervised civilians wanting to help but unable to effectively field for an active search method.

**Attraction** can use light (at night) and/or sound such as a siren or gun shots to attempt to bring the victim to a particular point. This is most productive when done from a location that is easy to access and visualize. It is also very important that it not be located close to dangers such as cliffs and that the attraction source not move once started.

**Containment** (or confinement) is used along natural linear features such as power lines, roads, etc. to try to keep the lost person from expanding the search area. Resources are stationed along a line to prevent the subject from crossing the feature undetected. It may also be possible to use mobile resources for confinement – for example a vehicle driving back and forth on a back road or an ATV patrolling along a power line.

**Track traps** are commonly used along confinement features, stream banks, and trails. It is any spot that is likely to register easily visible signs of a person's passage. Sometimes you get lucky, such as when there is snow on the ground, and the entire feature becomes a track trap.

**Listening posts** are yet another type of passive method. Typically there are at locations where sound carries well and where it is likely that sound produced would be from the lost person. A listening post may be combined with an attraction feature.

# Active Search Methods

- Resource is moving
  - Hasty Search



With Dogs



With people



There are several active search techniques. The hasty search is a fast moving small-team effort that checks likely locations and routes (trails, campsites, etc.). Typically, the optimal hasty team has a member who does navigation and communication and two or three other members who search for clues along the trail, road, stream-bank, etc. as they move toward the location (if any) to be checked.

Hasty searching is often the tactic employed first as it requires fewer trained resources and concentrates on higher-likelihood locations within an area to be searched. Unfortunately, hasty search routes and locations are the most likely to be run by untrained civilians, including ATVs and snowmobiles which frequently destroy clues. The best resources for hasty searches are those trained in basic SAR skills, especially clue awareness.

In all active methods be sure to look up in trees and behind you occasionally as the subject may not be able or want to respond to your calling their name.

# Active Search Methods (1)



On Foot

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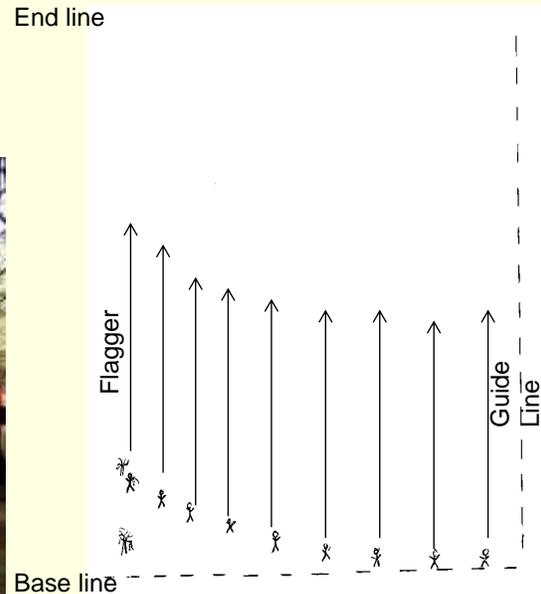
Typically a hasty search is along a trail that the person might have traveled. It moves quickly, periodically calling out the person's name and looking for clues on the trail and along both sides. The photograph shows a typical hasty team. Hasty searches are clue oriented and typically done on foot as clues are more easily spotted and a person's call for help heard. A hasty team should have GPS to record where they went and document clues, first aid capability in case the subject is found injured, and communications.

The team should move quickly looking for clues and calling out the subject's name. The most efficient hasty search using only people includes three people. #1 is leading the group looking for footprints and clues ahead of the group. Then #2 and #3 follow, one watching for clues on the left side of the trail and the other watching on the right side.

Teams should be particularly vigilant in looking for potential 'decision points' where somebody may have taken a wrong turn and left the trail. Those should be reported to the Command Post to determine if they should be immediately followed up on, or documented for possible future action.

## Active Search Methods (2)

- Resource is moving
- Thorough search tactics
- Grid search



Grid searching is a commonly employed tactic. It is very resource intensive and time-consuming, but thorough if done properly. It is more likely to be employed after more efficient methods have yielded no results or in cases where the lost person is believed to be immobile or not responsive. It can take as much as 80 man-hours to search a 1/2 mile square area with a tightly spaced grid.

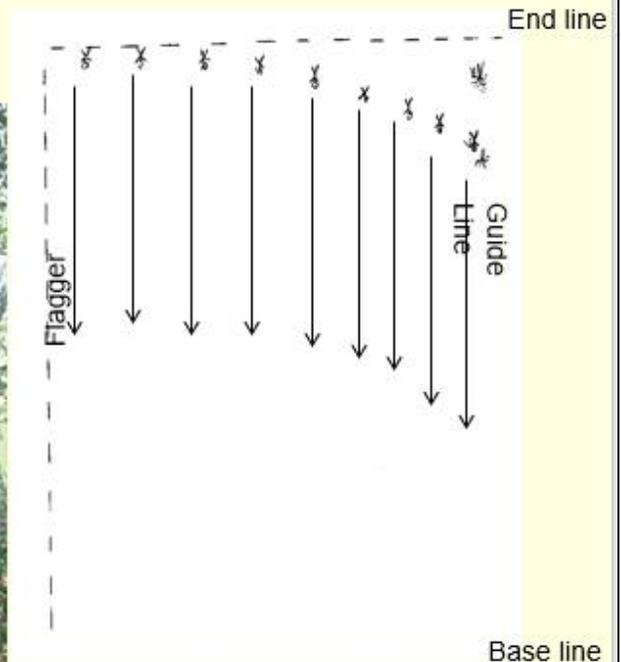
There are a lot of variations to the Vermont woods including fields and thick brush. While tight grids may move quickly through 5 acre fields, they could take significant time on a 5 acre clear cut 5 years old. The amount of coverage depends on the spacing which is determined by terrain, visibility and desired POD. Your team leader will discuss and guide the appropriate spacing based on the situation, but you should never lose sight of the person on either side of you. It can be effective and efficient to run two wider-spaced grid lines through an area at right angles to each other. Often it is possible to mix untrained civilian volunteers who are appropriately clothed and equipped with trained searchers on a grid search.

When running a grid line it is important to try to keep the line moving together. We try to use about a 30-45 degree angle to the person next in line so that you can keep them in your peripheral vision and able to stay focused on searching for clues. Don't forget to stop and look behind you and above you on a regular basis.

The starting point is with everyone lined up on the base line and then moving forward to the end line. The person who is the guide line walks the edge of the search area and is effectively the navigator for the search. The person on the opposite end is the flagger and puts brightly colored survey tape along their path.

# Active Search Methods (3)

- Resource is moving
- Grid search



After the first pass (shown on previous slide) the entire grid team moves over to the left (in this example) then the person who is the guide line follows the flags placed by the flagger on the previous pass and everyone aligns off of him. The flagger again places flags in preparation for the next pass. This continues until the assigned area is searched.

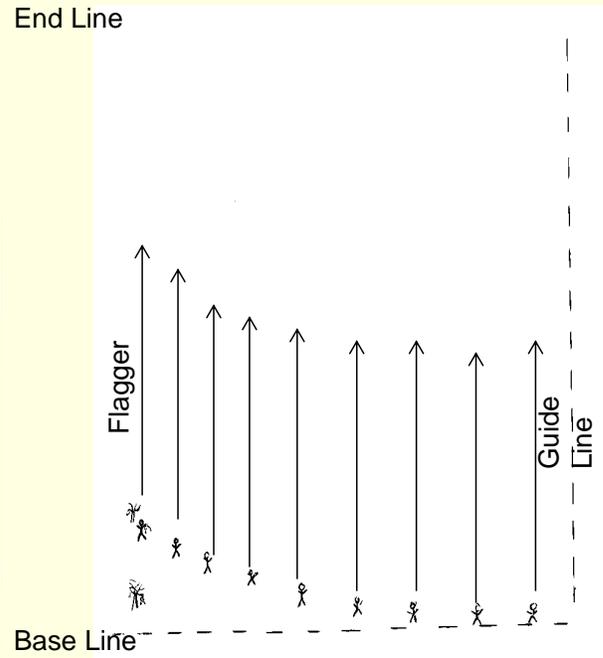
Usually the line moves in a slightly staggered pattern simply because it is much easier to keep in alignment when you are only worried about the person to one side and they are slightly in front of you. Any person on a grid-line can stop the line to check out a feature, potential clue, etc. but only the team leader may restart the search line. In any of these active methods it is important for searchers to periodically stop, turn a circle looking in all directions, and also look up off the ground into the trees. If the subject or a clue is found, only the team leader moves to them and will determine what further action will be taken,

**ALL OTHER GRID TEAM MEMBERS REMAIN IN PLACE.**

**This is absolutely critical to preserve evidence or a possible crime scene.**

# Grid Search Terminology

- Base Line
- End Line

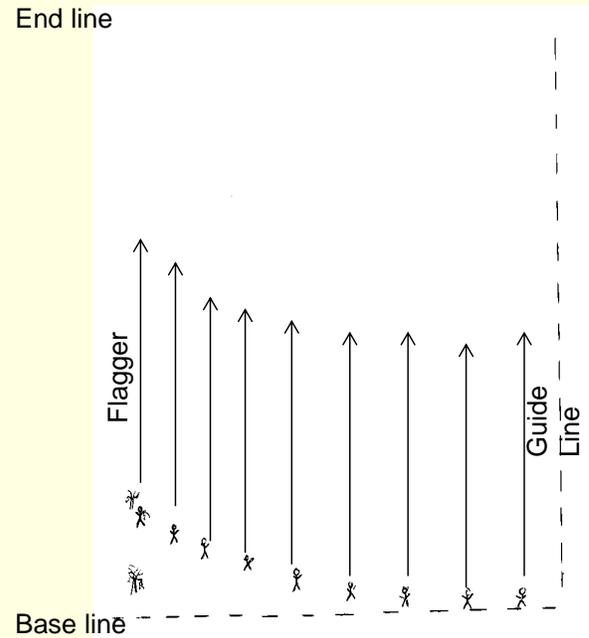


**Base Line:** The line that the searchers start on, spreading out appropriately for the type of terrain being searched and the size of object being sought. For example, looking for clues might be shoulder to shoulder but in an open woods looking for a person, the spacing might be several yards between searchers. The base line is frequently a road or other definable boundary but could be a line provided by the Command Post (CP) in a GPS unit.

**End Line:** The line at the other end of the search area and would be the turnaround point marking the boundary of the area being searched. Upon reaching this line, the searchers would offset and resume the search in the opposite direction until reaching the base line.

# Grid Search Terminology

- Base Line
- End Line
- Guide Line
- Guide Person
- Flagger
- Grid Line

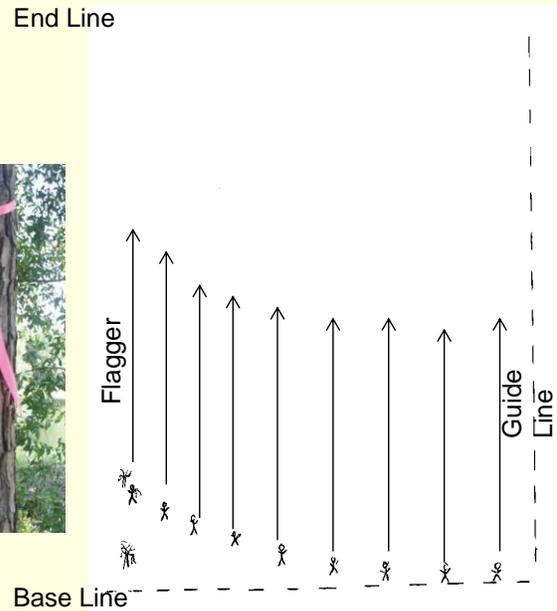


**Guide Line:** The edge boundary of the initial course through the search area. It forms one boundary side and along with the Base Line defines one corner of the search area. The Guide Line might be a road, stone wall, edge of a field, a stream or body of water, or might just be a compass bearing through the woods from the starting corner.

**Guide Person:** The person who establishes this line and must be sure to carefully follow it to ensure no area is missed during the search. The Guide Person will be on one end of the guide line and will frequently be the person recording a track on the GPS for the Command Post debrief. The edge of the search area may be defined by a road, natural boundary or a GPS track/route uploaded to the Guide Person's and Team Leader's GPSs.

# Grid Search Terminology

- Base Line
- End Line
- Guide Line
- Guide Person
- Flagger
- Grid Line



**Flagger:** This person marks the edge of the area that has been searched with brightly colored survey tape and establishes the Guide Line for the reverse direction search on the next pass. The Flagger will be on the opposite end of the line from the Guide Person.

**Grid Line:** The entire search team, the Guide Person on one end of the line and the Flagger on the opposite end, and all of the searchers in between. The difficulty of the terrain and size of item searched for should be taken into account before starting the first pass to establish the optimum spacing.

Upon reaching the End Line, the entire team will offset, or move along the end/base line, away from the searched area (in the example shown above to the left) until the Guide Person reaches the flagged line. The team will then resume the search in the opposite direction until reaching the Base Line. During this search, the Flagger again marks the edge of the area that has been searched.

# Critical Spacing

- The spacing between searchers such that an object or subject being looked for may be placed half way between searchers and be just visible to both.
- If you are looking for a hunter in bright orange, a hunter in camouflage or a candy wrapper the distance might vary considerably.
- Terrain and underbrush will make a difference too.

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Critical spacing will vary as you progress through an area and you move from open hardwoods to alder patches for example. The different conditions will need to be accounted for by altering the distance between searchers as you go.

## Purposeful Wandering

- This can be done in conjunction with a hasty or grid search and means to investigate possible spots the subject might be.
- The term means that you check out things near your path such as a cave, a spot of heavy underbrush, an old building, vehicle, or behind a fallen tree.
- Purposeful Wandering takes a little longer but is more thorough.



The best searchers are naturally curious. If something doesn't look quite right or looks out of place, check it out.

If something is blocking your view, such as a blowdown, ledge or boulder, it's OK to leave your route for a minute to take a closer look.

# Active Search Methods (4)

- Dog teams
- Dive teams



Dog teams involve partnerships between a handler and a dog and often there will be a flanker as well to handle communications, navigation and provide an extra pair of eyes for clues. There are two types of dog teams. A scent discriminating dog team uses an article of clothing or something with the smell of only the lost person on it and does tracking or trailing. This type of dog normally works on a lead and roams until it detects the scent for which it is searching. At that point the dog will follow the person's scent.

Air scent teams use dogs off lead. These are dogs that have been trained to find any human in the area. They work an area moving into the wind searching to catch a scent on the air and then verify it is a human. Once the person is found they will return to the handler and give a trained alert to indicate they found someone and will guide the handler to the person.

Air scent teams typically work in areas where there are no searchers assigned but if you are found by one, wait until the handler arrives and follow their directions. They will reward the dog for finding you and tell them that you are not the right person and then you can both continue.

Dive teams are typically all members of a single agency (e.g. Vermont State Police, Colchester Technical Rescue, etc.) and typically are not deployed until there is some sort of localization of a drowned person because searching large areas under water is impractical. Dive teams specialize in searching in the water including under ice searches, often for snowmobilers or ice fishermen.

# Active Search Methods (5)

## ■ Efficient Search Patterns

- Critical separation
- Track cutting



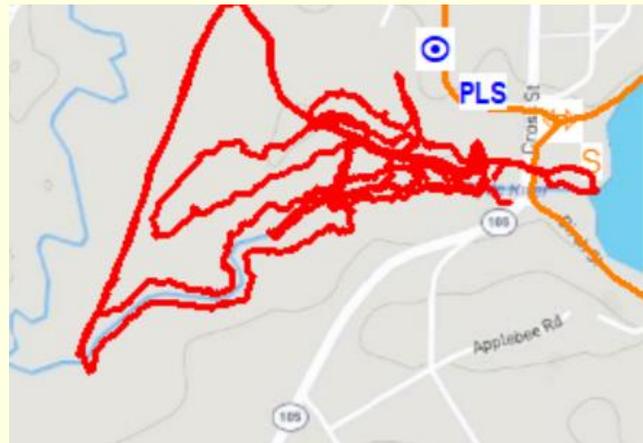
Another active method, sign-cutting and tracking may be used day or night. This involves specially trained individuals or teams of 2 or 3 who attempt to cut across an area to detect signs of the passage of persons (broken spider webs, bent grass, footprints, etc.). A tracker may also follow the trail of the person from the PLS or LKP as well.

Critical Separation is a term simply referring to the placing of search assets at the distances apart to provide positive coverage with minimal overlap (i.e., the most efficient use of resources). On a grid team it might mean that each individual is close enough to be able to cover half the area between them and the next person with minimal overlap. This will vary with terrain and vegetation as well as the search subject (i.e., do they want to be found, are they expected to respond to searchers, what color clothes were they wearing, etc.).

Protecting the PLS is critical for many reasons but two that we have discussed here are because starting a tracking dog or a person skilled in tracking is much more effective with little or no disturbance of the area.

# Navigator

- Keeps track of crew location
- Insures the crew is working in the area assigned



The Navigator may or may not be the Guide Person and will establish the correct starting point and the Initial Guide Line. The Navigator is responsible for ensuring that the correct area is being searched and that the search area is being adequately covered considering the terrain and object/person being sought. Search teams may upload the search area on the Navigator's GPS unit. This is immensely helpful to ensure that the correct area is being covered. After the search unit has completed their assignment, the track will be downloaded and plotted on a computer to determine if that area has been adequately covered or needs to be re-searched. This also helps accurately document what areas have been searched.

# Night Search

- The subject is very likely to be immobile
- Across-the-Ground lighting shows signs and tracks better.
- Usually reserved for dog teams and aircraft with Forward Looking InfraRed (FLIR).

Active methods may be used at night. This is the case with tracking, dog teams, and some air assets (those with FLIR capability). UAS (drones) with FLIR may also be an option if available. Searching at night requires highly trained individuals who are very comfortable with the mechanics of moving through the woods and confident in their ability to stay oriented. Night search may be dictated by the urgency of the situation. A benefit is that the subject is much more likely to remain in one place. One of the constant problems with SAR is that if the subject is mobile, he or she may get back into an area already searched and not be found for days.

Another benefit of night search is that the lower lighting provided by headlamps and flashlights creates longer shadows that show signs such as bent grass and footprints much better. A disadvantage of night search is that the subject may seek shelter (in a shallow cave, under a bush and leaf pile, etc.) and children may be asleep and not hear searchers calling. All of these factors must be constantly in mind during a night search operation.

# Search Team Leader

- Responsible for crew safety
- Responsible for reporting to the Command Post for assignments and debrief
- Insures that the crew works effectively
- Makes decisions regarding crew tactics to achieve the crew assignment
- Responsible for communications
- Responsible for documenting crew activities and tactics
- Responsible for debriefing the crew

The Search Crew Leader, or Search Team Leader, has many responsibilities. The leader's responsibilities in the field can easily make it ineffective and impractical for him/her to actively search. It is typically the leader on the hasty team who orients and communicates. It is not unusual for a grid team leader to move back and forth behind the actual search line. Part of the responsibility for effectiveness and safety comes before the crew ever leaves the staging area. Inspecting potential team members for appropriate clothing, equipment, and footwear and briefing them on the assignment prior to the start of the search are important functions.

In the field the crew leader makes "in-flight" adjustments. As an example, the team may be spaced at 12 yards apart and encounter a dense clearcut. To ensure thorough coverage, the line leader may opt to put people at 4 yards apart, come back again, and then move ahead through the last third of the width of the clearcut, and re-space back to 12' based on the flag line. (If you covered only 1/3 of the original width you would then have to make 3 passes).

One might think of the Search Team Leader as the 'mother hen' of their crew, with overall responsibility for supervising, organizing and keeping them safe.

# Search Team Member

- Responsible for safety of self and others
- Does most of the actual searching
- Must follow the directions of the crew leader
- Maintain suitable behavior and discipline



The slide shows your responsibilities as a Search Team Member. While each crew may have a designated safety officer (which often is the team leader), **every team member is a de-facto safety officer**, accountable for themselves and the other members of the team. If you see something of concern **speak up!**

Safety is everyone's concern so you and your team do not become part of the problem through injury or becoming lost.

# Sound Sweeps



- Sound usually travels further than you can see
- If the subject is expected to be responsive critical spacing may be increased.
- Must be coordinated so searchers don't hear each other and think it is the lost person.
- Everyone whistles or shouts; then everyone one listens.

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Coordination is critical and there are several approaches and search leadership (Incident Command or Command Post [CP]) may determine what method will work best in their area.

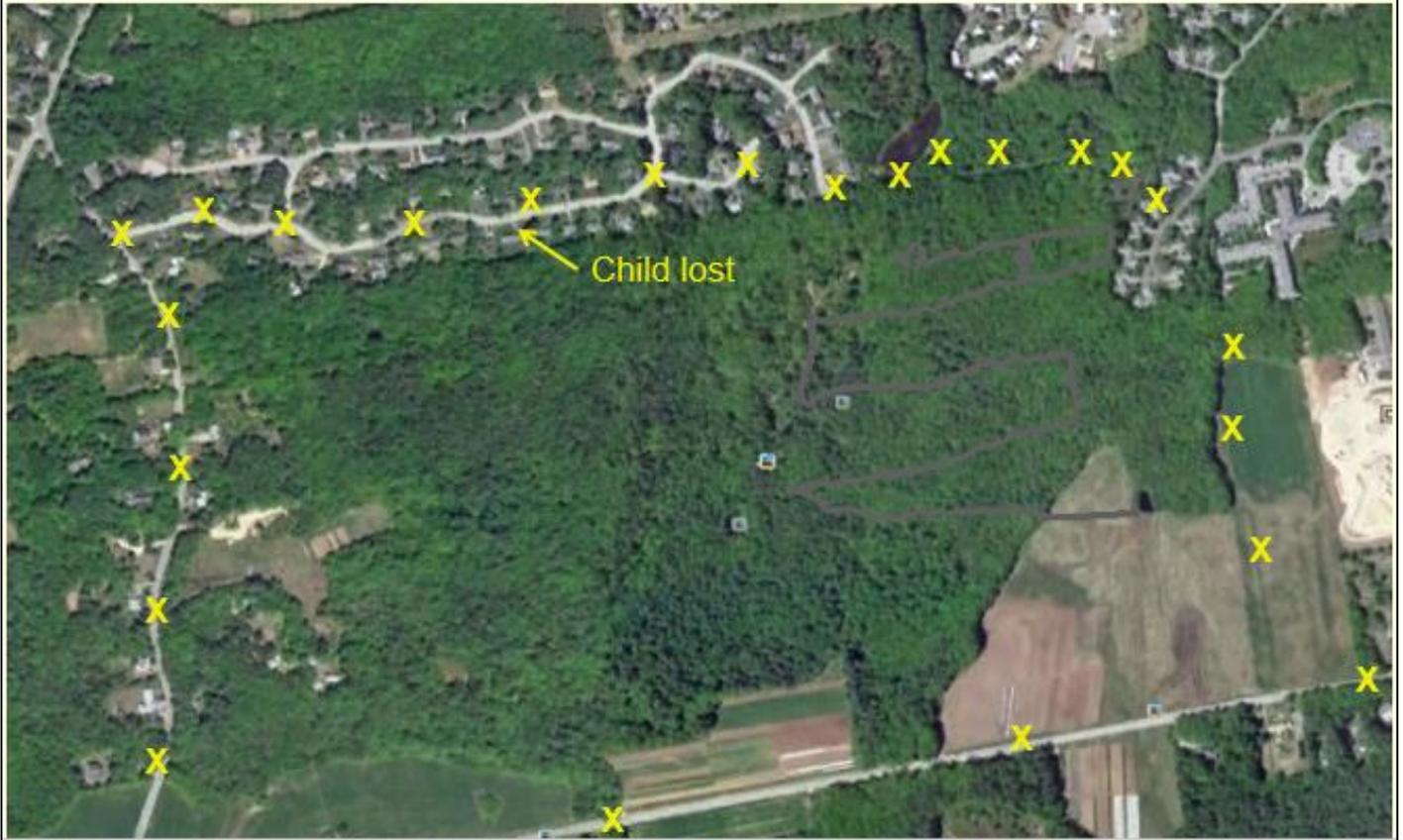
One method is to employ the technique on the hour, at 20 minutes after the hour and at 20 minutes before the hour. These times would be preceded by a radio command of "STAND BY FOR SOUND SWEEP" followed by a radio command "BLAST"

After the whistle or shout all searchers will remain silent for a pre-determined time (30 seconds to a minute) listening for a response.

If a response is heard immediately take a bearing to the sound with your compass, call the CP to report the possible response and request a second blast.

If a second response is heard, adjust your initial bearing as needed and report it to the CP with your LAT/LONG, the bearing and your best guess at the distance and request guidance from the CP on how to proceed.

# Containment



Containment is a tactic mentioned earlier and is frequently used when the subject may be mobile.

The idea is to surround the search area as effectively as possible to keep the subject contained and prevent the area from expanding over time.

You may be asked to be an observer along a barrier such as a road as illustrated with the yellow X in the map above.

# Working With Other Resources

- Dog teams
  - Tracking
  - Air scent
- Listening posts
- Infrared detectors
- Technical rescue teams
- Trackers
- Aircraft
  - Fixed wing
  - Rotary
  - UAS

As a ground searcher you may be asked to work as part of a specialized resource. The first rule is if it makes you uncomfortable or you are being asked to do something you are not able to, do NOT accept the assignment. The second rule is to discuss the specific dos and don'ts of the applicable methods shown on the slides with the leader for that particular team effort. Many have been described in basic concept, some will be described in a little more detail in other modules.

As an example, if you are assisting a tracker or sign-cutter, that person will not want you working next to them, needing instead to have you flanking but slightly behind them and very alert to keeping that position.

It is far better to ask a lot of questions up front than to make a mistake during a search that could put the search or searchers at risk.

Lesson topic 15 will go into more detail on working with specialized SAR units.

# Congratulations, you have finished this module

You may close this window to return to the main course and select another module to complete.

Be sure you keep track on your course checklist so you know which modules you have completed.