

Canine and Equine SAR



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Unit 21: Canine and Equine SAR

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Search Crucials

- Search is an Emergency
- Search is a classic mystery
- **Search for clues not just the subject**
- Know if the subject leaves the search area
- **Close grid search as a last resort**
- Manage by objectives
- Search management is information management

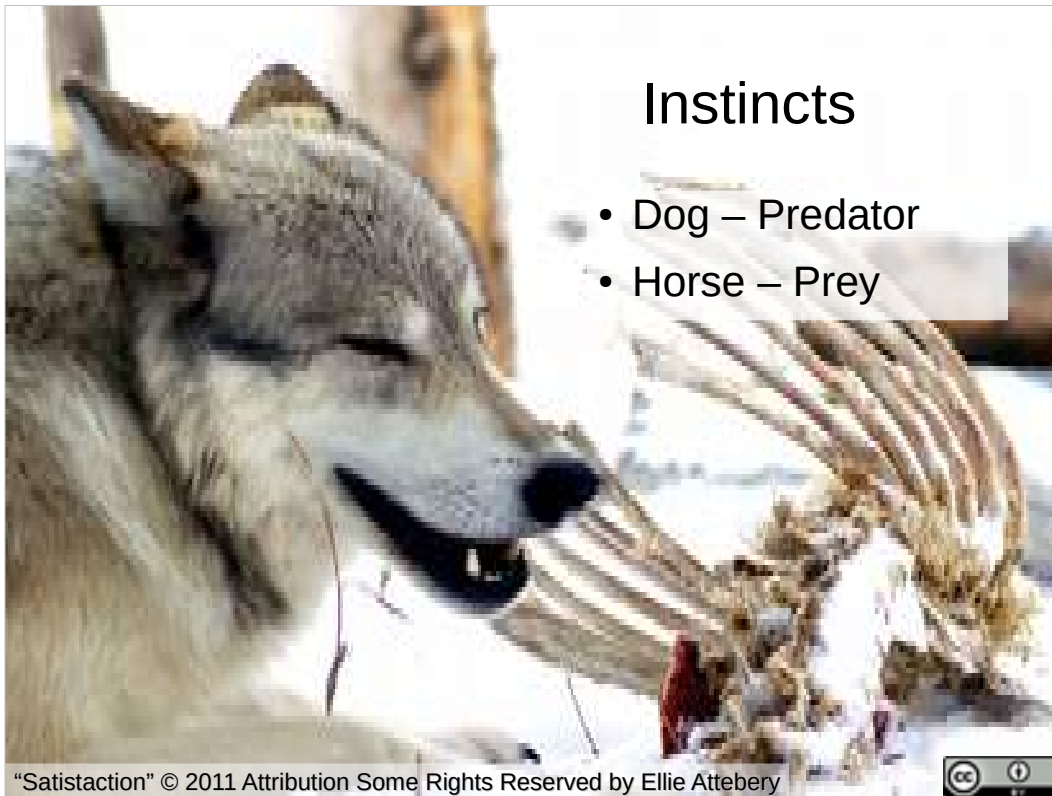


Dogs and Horses can be very effective resources for efficient, minimally destructive search.

Are there clues that dogs or horses can detect that human searchers can't?

What?

Why?



Dogs as sensors – they are predators.

Horses as sensors – they are prey.

How do they differ from humans?

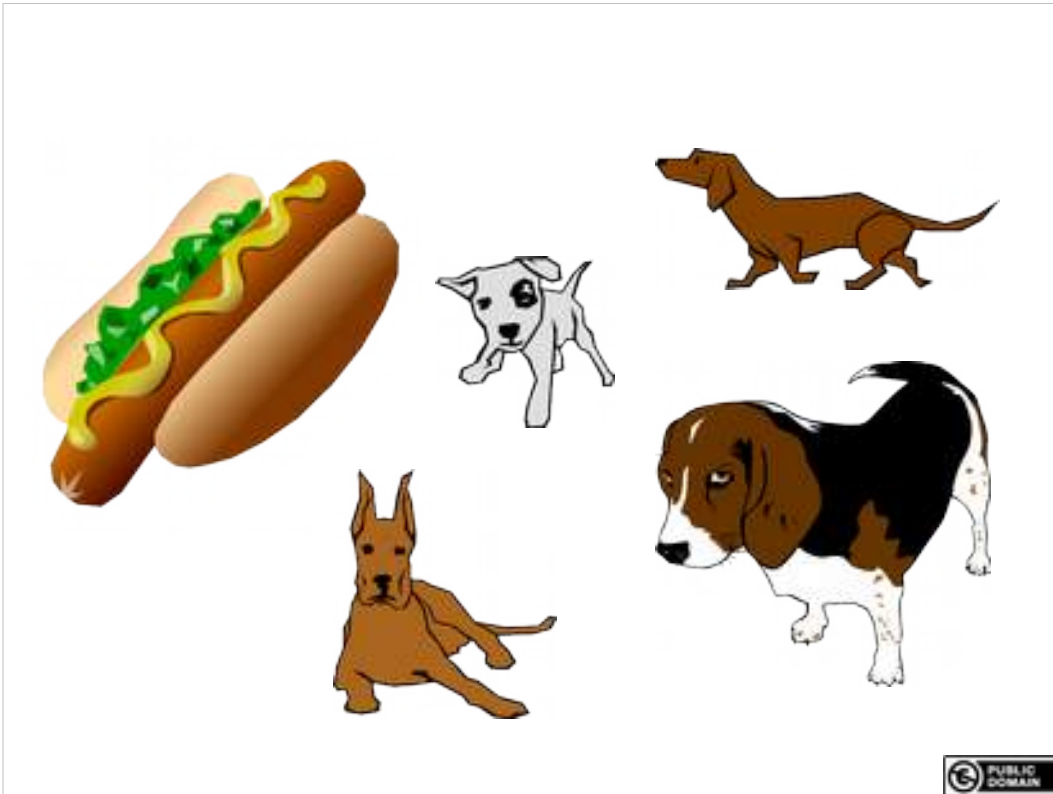
Are dogs just detecting with their noses?

Call out the dogs!



Requesting resources:

Call out the dogs...



What sort of dogs?

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FEMA Typed Canine SAR (ESF-9) Resources

- Canine Search and Rescue Team – Wilderness Air Scent
 - Type I, Type II, Type III, Type IV
- Canine Search and Rescue Team – Wilderness Tracking/Trailing
 - Type I, Type II, Type III, Type IV
- Canine Search and Rescue Team – Land Cadaver Air Scent
 - Type I – disaster, Type II - disaster
 - Type III – non-disaster, Type IV – non-disaster
- Canine Search and Rescue Team – Water Air Scent
 - Type I, Type II, Type III, Type IV
- Canine Search and Rescue Team – Avalanche Snow Air Scent
 - Type I, Type II
- Canine Search and Rescue Team – Disaster Response
 - Type I, Type II, Type III, Type IV



FEMA, as part of NIMS, has developed resource type descriptions for SAR.

These include 6 typed canine SAR resources.

Handout.

Some Canine Resource Types

- Wilderness Air Scent
- Tracking/Trailing
- Cadaver/HRD
- Water Search
- Article
- Avalanche
- Disaster: Live Find
- Disaster: Cadaver/HRD
- Patrol (ESF-13)

There's common names for these resource types. We'll focus on the top three.

Wilderness Air Scent dogs find any person in an assigned search area. Tracking/Trailing dogs follow the scent of a particular person. Human Remains Detection dogs search for the remains of deceased people. Water search dogs search for human remains in the water from shore or boats. Article dogs detect objects with human scent on them. Tracking dogs may also detect articles with the subject's scent on them. Avalanche dogs detect people under snow. Live find disaster dogs find living people buried in collapsed structures, Disaster HRD dogs find the remains of deceased people in collapsed structures. These ESF-9 resources should be distinguished from patrol dogs (with a law enforcement function).

Wilderness Air Scent



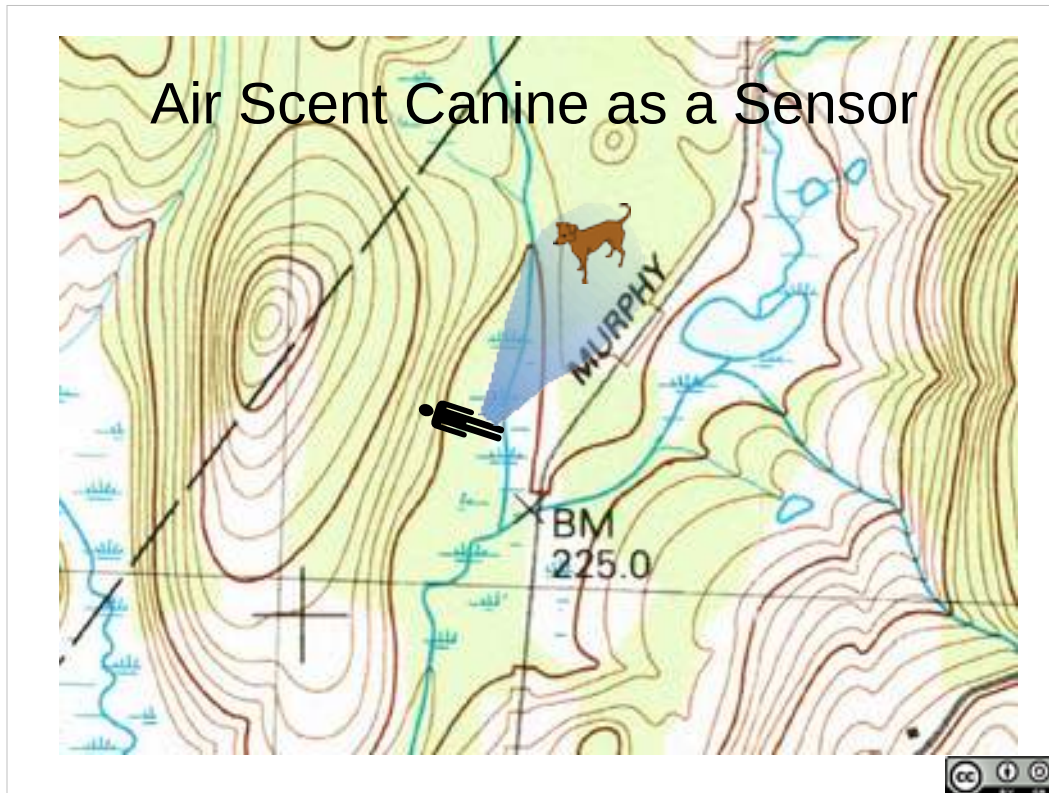
Air scent dogs. (Wilderness Air Scent, Live Find)

Air scent dogs are trained to detect and alert on any human.

Can work in urban parkland, suburban, and rural environments as well as wilderness. Can work inside structures.

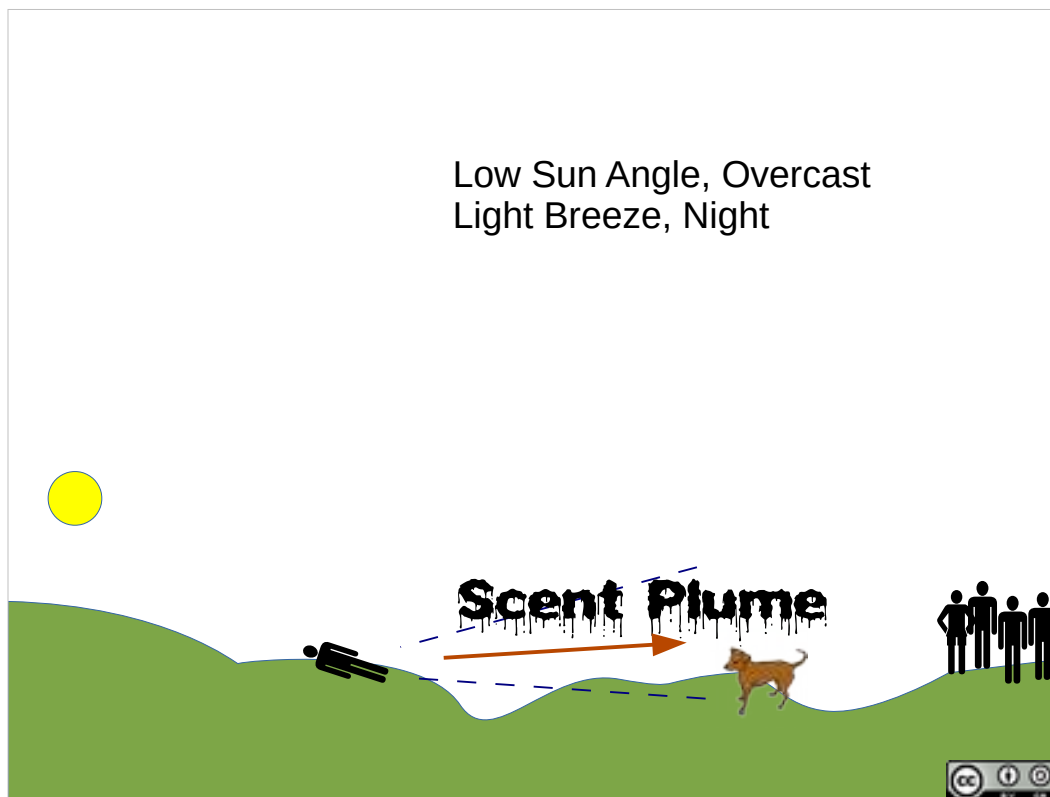
Work well with clue aware searchers.

Regionally, nationally, and globally, predominantly volunteer resources.



Wilderness air scent canines can be thought of as detecting a scent plume coming off of a subject.

How does this differ from a human searcher? [It isn't like the exponential detection function. Detection distance is influenced by how the air is transporting scent.]

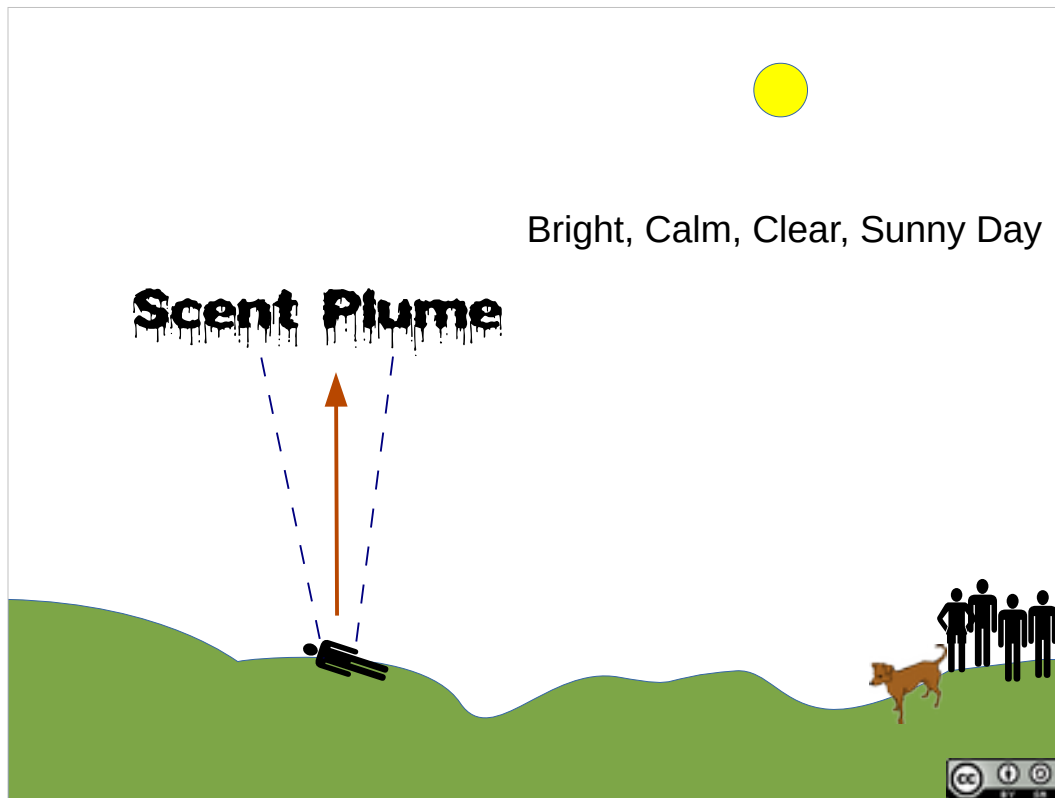


Best case – good conditions for working scent.

Atmospheric conditions are stable (air near the ground is remaining near the ground rather than rising). There's a light breeze, with a steady wind direction, making a long scent plume from the subject near the ground.

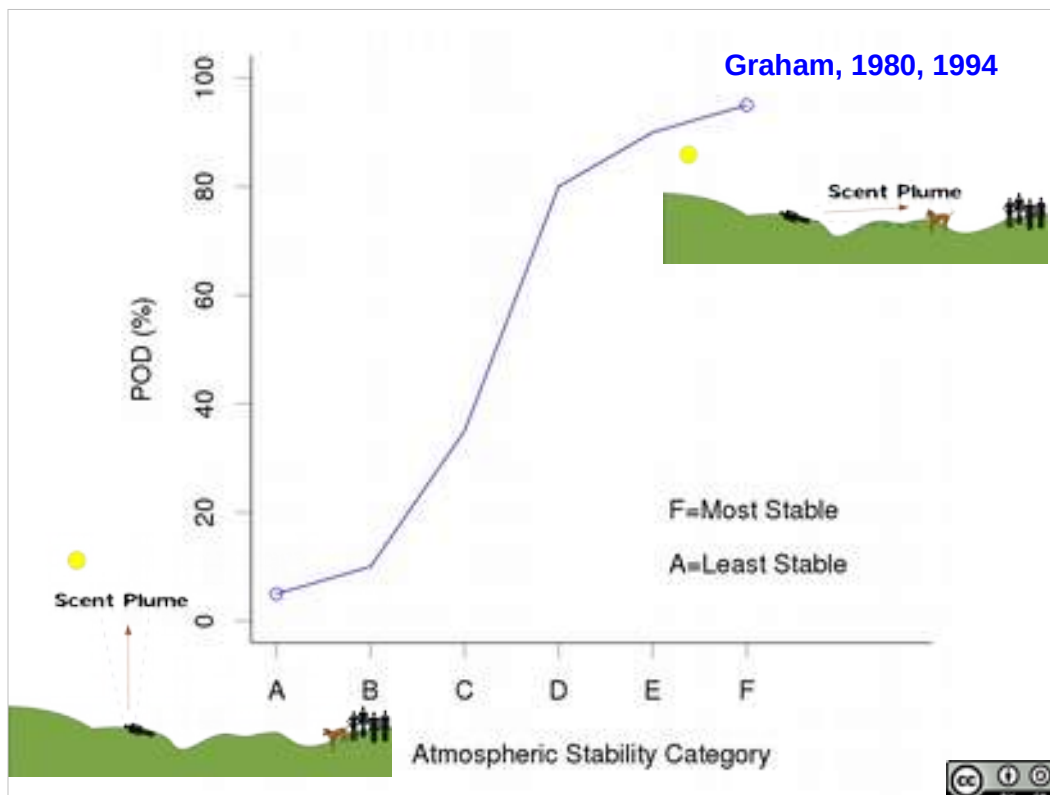
Night. Overcast. Low sun angle (morning/evening) – best conditions for stable atmosphere.

Search Crucial: Search at Night.



Worst case: Bright calm clear sunny day. Unstable atmosphere. Warm air near ground is rising up (carrying the scent with it).

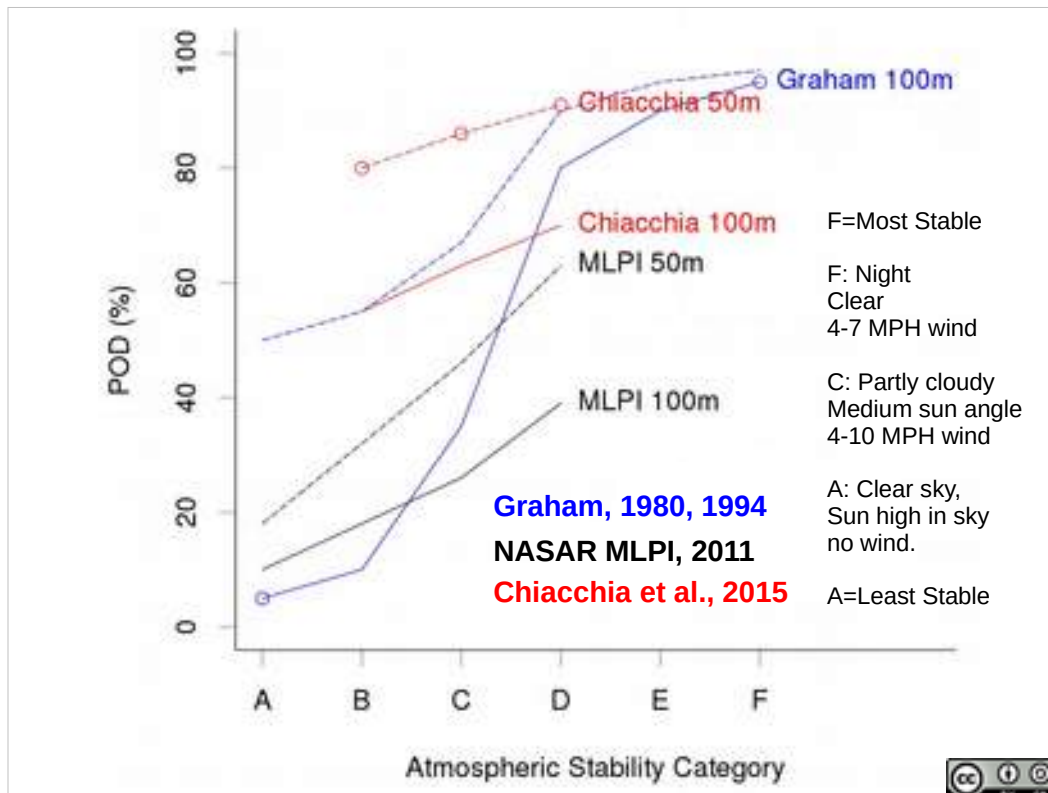
Search Crucial: Search at Night.



Canine handlers working a wilderness air scent area problem can estimate a POD.

Here's a graph translating the diagrams we just saw into POD values, with a handler gridding a segment at a 100 meter spacing.

Best understood factor for estimating canine POD is atmospheric stability. Unstable air rises, taking the scent with it, leaving little for the canine to detect. Stable air with some wind creates a scent plume near the ground that the canine can detect.



Unfortunately not quite that simple.

There are three different schemes for providing a canine POD value from atmospheric stability and grid spacing, mostly based on little data and many assumptions.

Here is a comparison of the 100 m and 50m grid spacing values from the NASAR MLPI text (black), from the original work by Graham (blue), and from a recent study by Chiacchia et al. (red). Circles are data points. Everything else is extrapolated. Dashed lines are POD for the handler working a grid at 50 meter spacing, solid lines for the handler working a grid at 100 meter spacing.

Poor conditions: Handler can adjust tactics by using closer grid spacing (50 m or 25 m) to get better POD.



It is more effective to split up the responsibilities in the assignment.

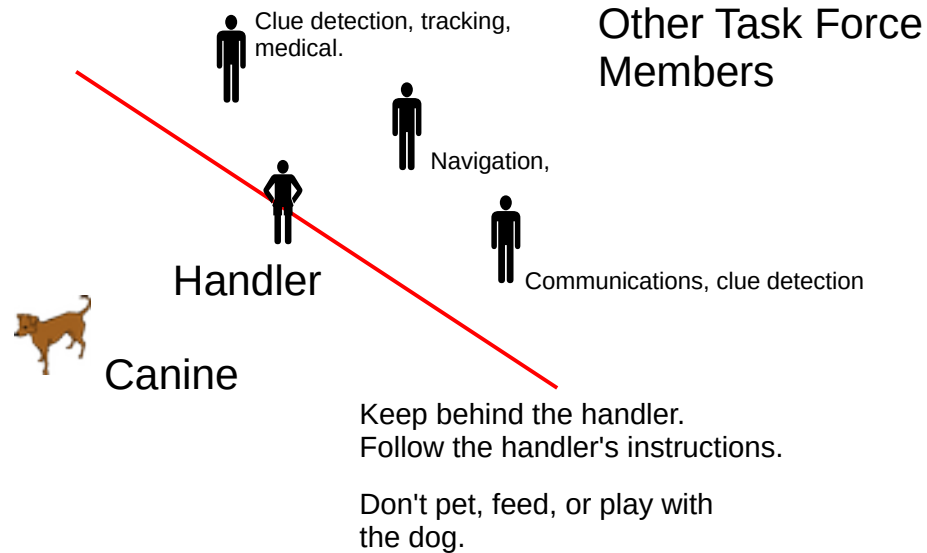
Best practice: 4 people on the assignment.

On a four person task force, the handler can focus on observing the behavior of the dog. The other members of the task force handle responsibilities for land navigation, communication, looking for clues, and medical care of the subject.

A four person team is the minimum size capable of splitting up without leaving anyone alone.

What are some circumstances that would lead to a task team splitting up? *[injury, discovery of a crime scene – situations where incoming resources need to be met and guided in (on a marked route) to the site]*

Working with a Canine Task



If on a canine task, a couple of ground rules:

Draw a line through the handler's shoulders.
Everyone else on the task must remain behind this line at all times. No exceptions.

Don't pet the dog, play with the dog, or feed the dog.



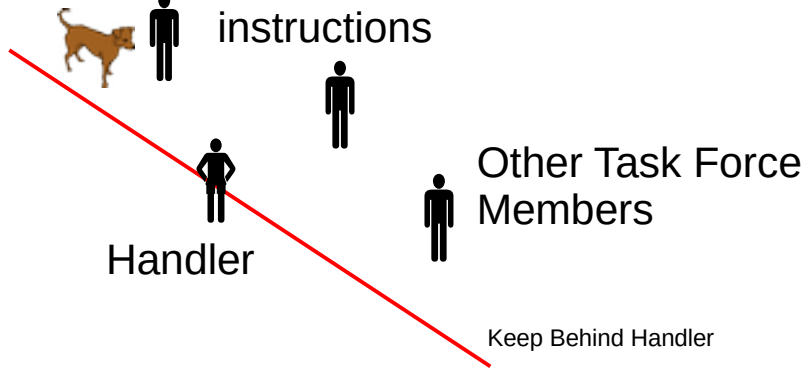
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What are some circumstances that would lead to a task team splitting up? [injury, discovery of a crime scene – where incoming resources need to be met and guided in (on a marked route) to the site]

The dog may check your scent

Don't pay the dog any particular attention.

Follow the handler's instructions



An air scent dog may “take inventory”, coming up to each member of the task and checking their scent.

This may be an indication that the dog has encountered a new scent.

Just let the dog work, don't pet it or pay it any particular attention.



Untrained Alert Behaviors

This dog is in scent – he smells a human.

There is a subject buried in the snow. The dog is showing untrained behaviors (e.g. changes in pace, posture, tail position, tail motions, breathing rate) characteristic for that dog that the handler learns to recognize when the dog detects human scent and starts trying to locate the source.

When handlers observe untrained alert behaviors they should record the location and wind direction – **or ask you to.**

The dog may work from the location it is getting into scent up to the subject, or the scent may be discontinuous, or the subject may be inaccessible.

Trained Indication



A trained behavior that the dog exhibits on finding a subject (or in detection work, on locating the source of odor).

Sit is one typical trained indication, bark is another.

Wilderness Air Scent: Refind



Find



Alert



Refind

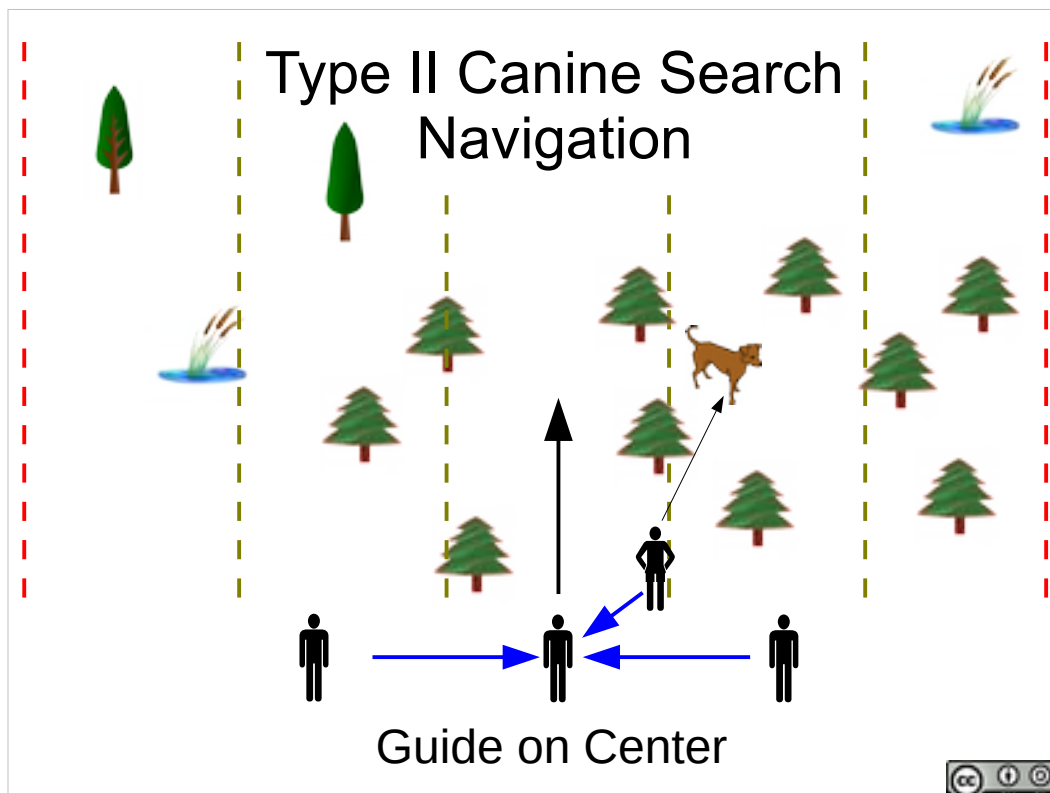


The trained indication may occur at the subject, or at the handler.

A trained indication may be a “bark alert”, at the subject's location. The dog stays and barks at the subject.

Or a trained indication may involve a find/alert/refind behavior chain. On finding the subject, the dog returns to the handler, performs a trained behavior (sit, bark, etc.) and then performs a re-find to bring the handler back to the subject.

This dog has is finding a subject, returning to the handler to perform a trained indication (a sit), and then returning to the subject in a re-find.



To best focus on watching for undrained alert behaviors, the wind, the terrain, etc, the handler can be most effective if they can focus on the dog, while:

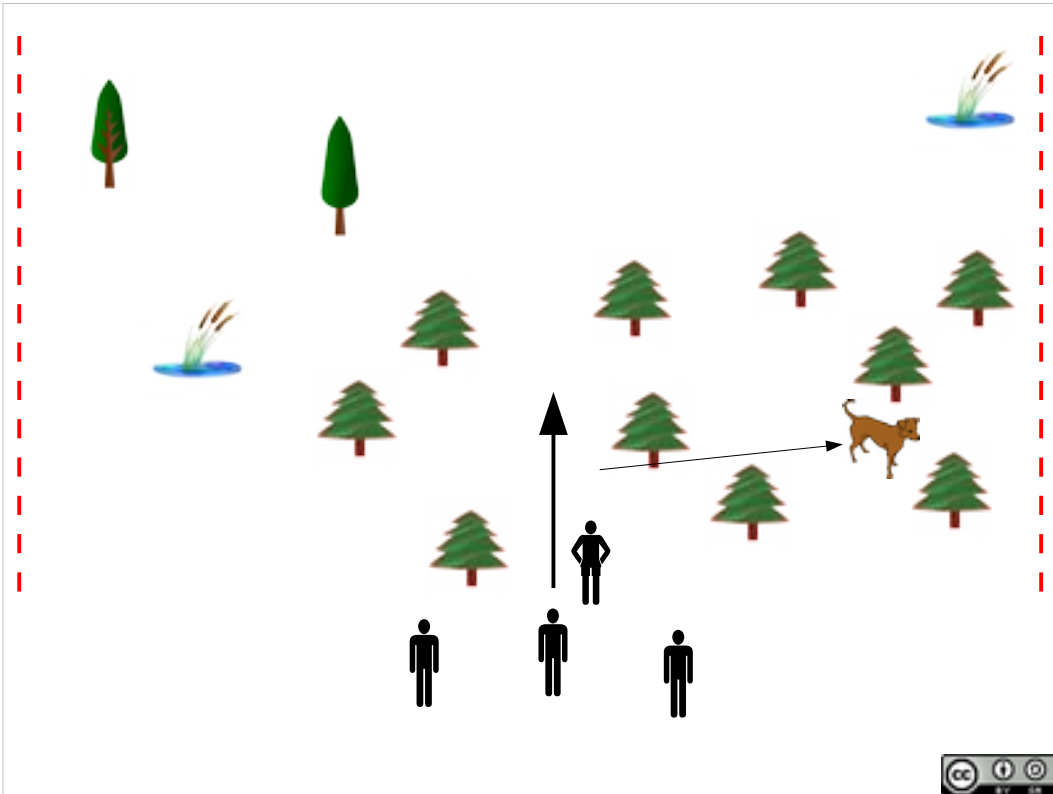
Someone else navigates and sets the control line.

Everyone else (including the handler, out front) positions themselves off of the guide person.

Searchers flanking the guide person can do purposeful wandering in their search lanes.

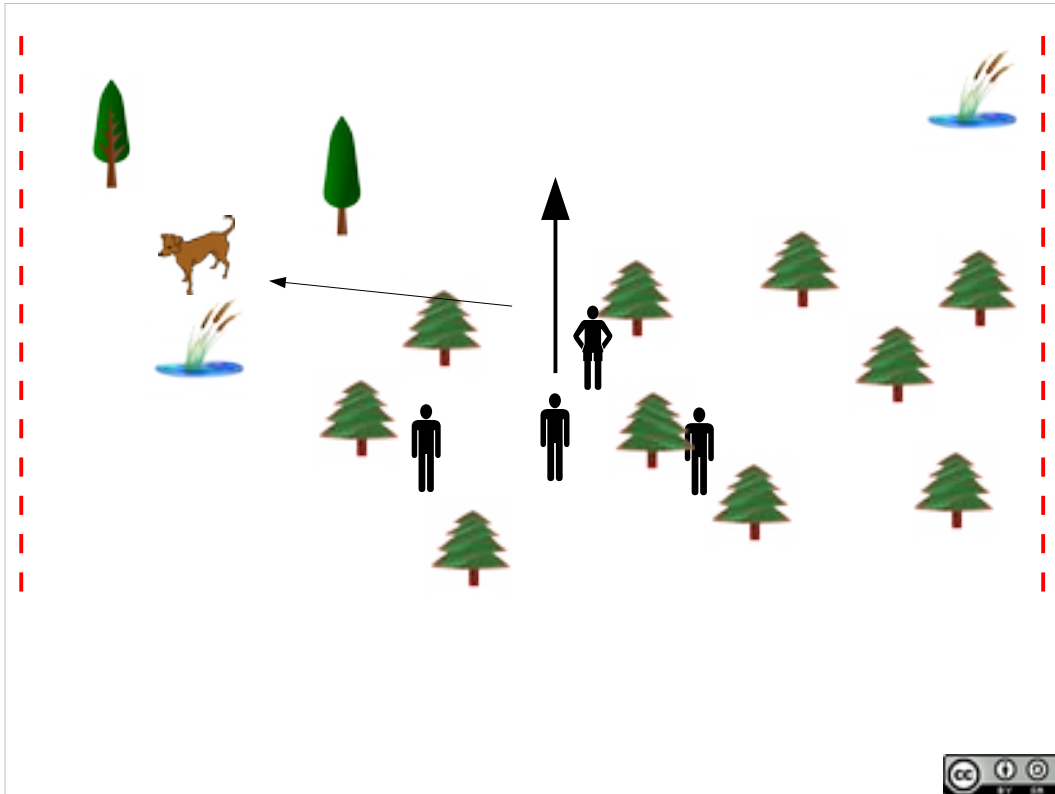
Everyone looks for clues.

Dog's sweep width will probably be wider than the human task's sweep width.



Dog typically ranges right and left of the handler's path.

Dog's sweep width will probably be wider than the human task's sweep width.



The dog's ranging may be very directed by the handler, or may not.

Wilderness Air Scent



Air scent dogs can be assigned to search areas or routes (where routes can be trails, powerlines, drainages, or other travel corridors, not just trails).

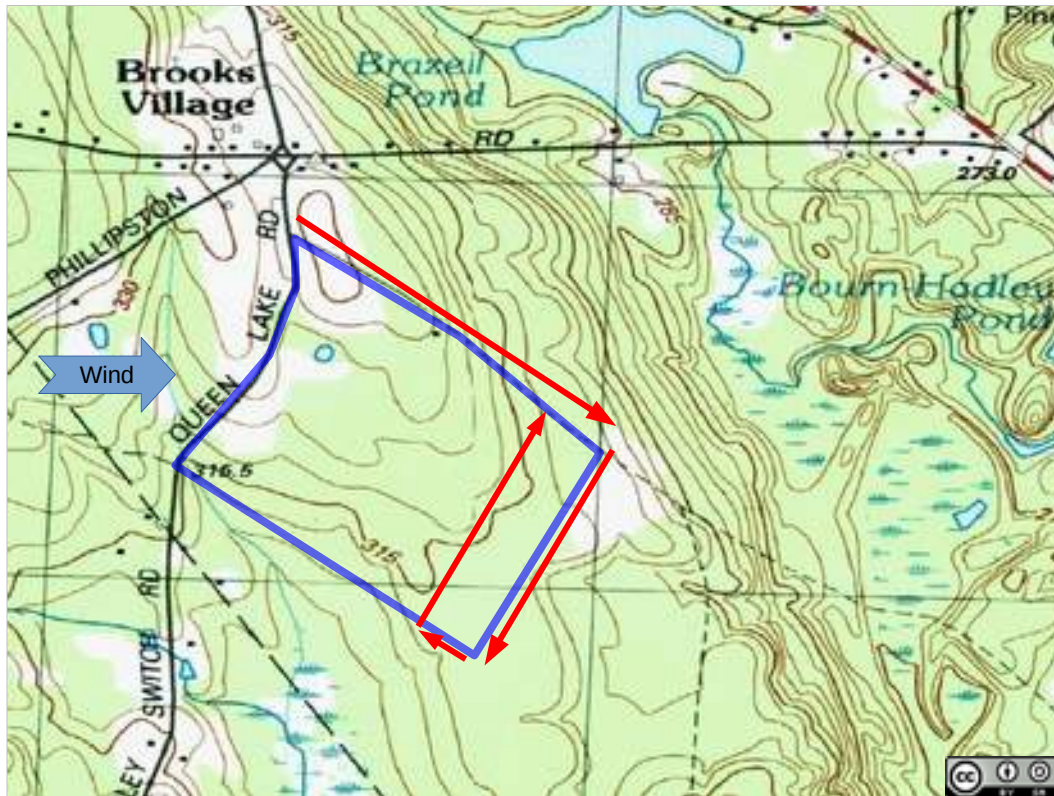


If given an area

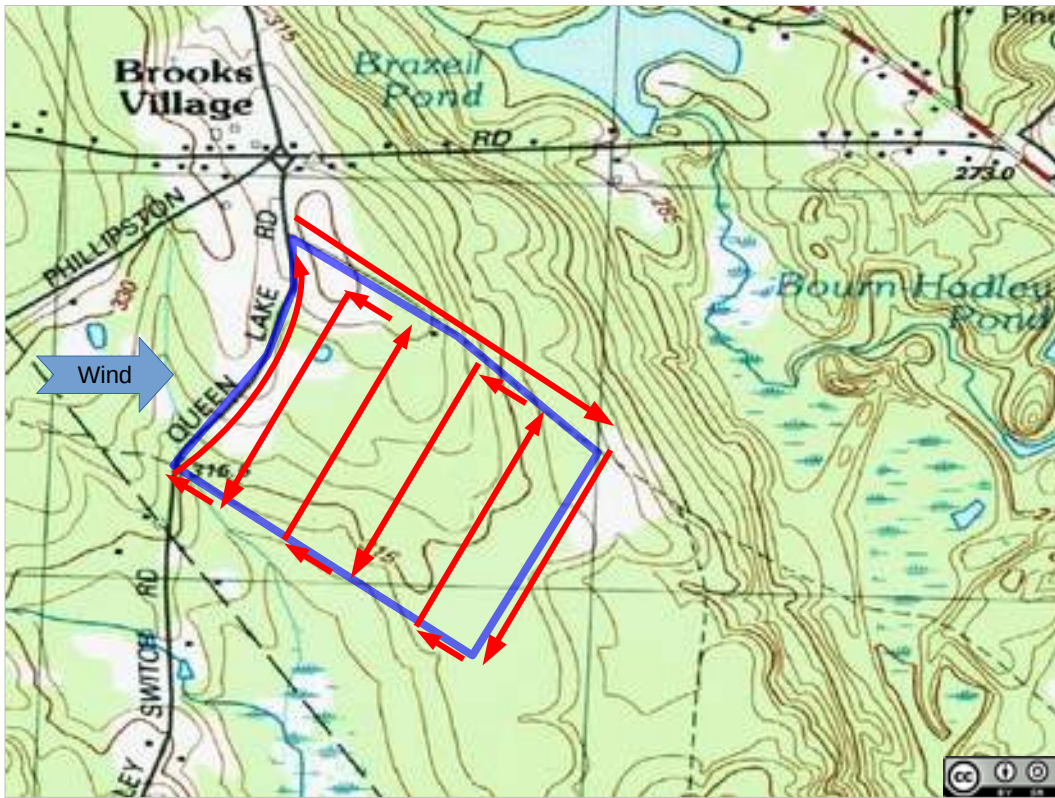


Where's the Wind?

A wilderness air scent handler will ask how the air is moving – both the larger scale prevailing wind, and when they get out in the field, what the local flow of air is doing (and how it is varying (both near the ground where the dog's nose is, and higher up) – thus canine handlers tend to carry talcum powder or other fine powders for checking the wind).



The wilderness air scent canine handler will then usually try to work the segment by gridding from the downwind end up towards the upwind end – with the grid lines running cross wind. The goal is to get the most chances of putting the dog's nose into a scent plume from the subject. (This is the handler's track, the dog will probably range off of this track).



Traversing the entire segment in a grid running across the wind.



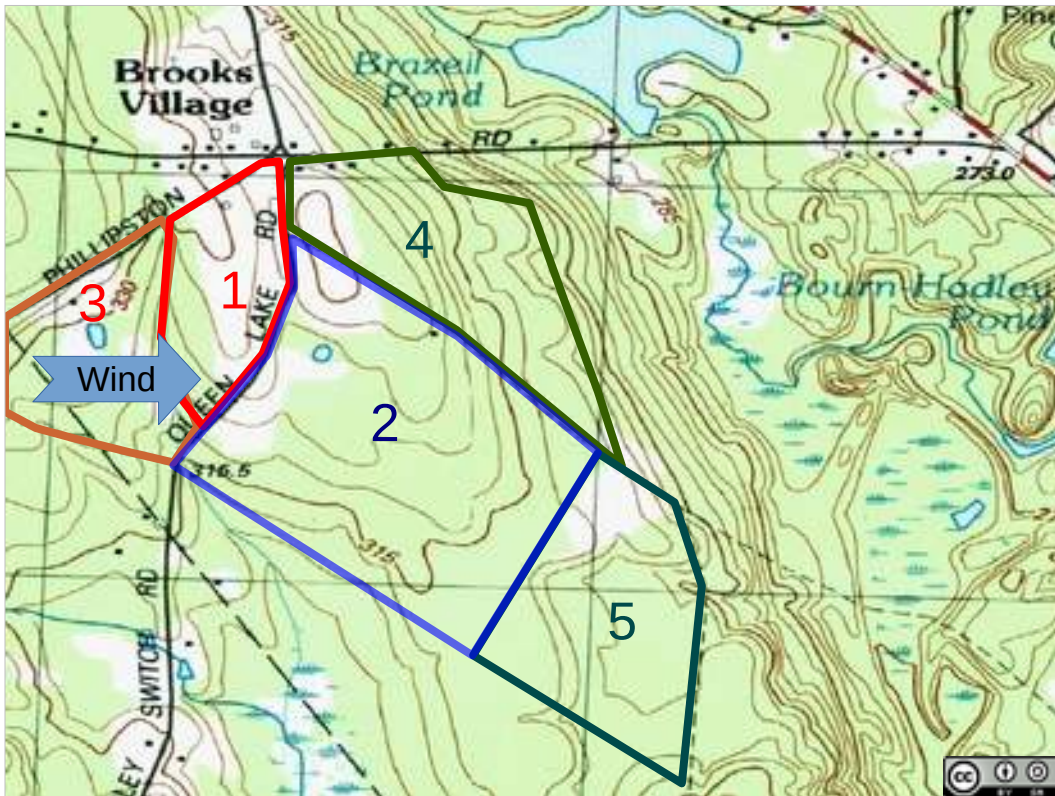
But, the dog might start showing untrained indication behaviors and start working away from the handler.

Here, the handler may ask you to record the location and get a bearing on the wind direction.

(About what is the wind direction here? [about 270 degrees – ‘wind from’])

Or, the handler may leave the planned grid and follow the dog – what do you need to do? (flag the location, record the location and follow the handler).

The dog may stop working scent (there may be discontinuous scent pools rather than a clean scent cone to the subject) and the handler may want to return to the grid at the point you left it to continue the grid of the segment.



Dogs don't know where the segment boundaries are.

An air scent dog may detect searchers in an upwind segment (the dog is imprinted on any human odor).

Coordinate to try to avoid having searchers immediately up wind of a the boundary of a canine search segment (at least when the canine is near that boundary).

Example: coordinate searchers in Segment 1 with an air scent canine task in Segment 2.

Practical Evolution (1) (Bearings and distances on map for marked segments).



Bloodhounds. May be that breed, or another breed.

Tracking dogs train to follow the subject's trail very closely, like mantrackers working step by step.

Trailing dogs train to follow the subject's scent trail more loosely.

Work well with mantrackers (who may be able to see corroborant, definitively human, or identifiable sign from the subject on the scent trail the dog is following).



The handler will want to obtain an uncontaminated scent article.

Can be deployed at a PLS or LKP to determine direction of travel.

May follow a track that is not the subject's, treat a track, as with all other clues, as having some probability of being a red herring.

Tracking and Trailing dogs work effectively when combined with mantrackers.

Why? (A mantracker may be able to find identifiable sign along the dog's track – confirming the track is of the subject, as well as definitively human sign indicating that the dog is following a person, spot clues, etc.).



Navigation for a Tracking/Trailing task involves keeping track of where the dog is taking you.

Tracking dog is going this way. Where do you put searchers?

Consider leapfrogging some resources out ahead of the direction of travel.

Don't focus on just this track. Keep doing everything else. Protect the IPP, establish containment, investigate, search the area high probability area around the IPP, search travel corridors from the IPP to the containment boundary, search high risk and high probability places.



Tracking/Trailing dogs require a scent article with the subject's scent on it.

Easily contaminated – has a nice scent for the dog on it, but not the scent you think is on it.

Let the handler identify, collect, and handle an appropriate scent article.

"We've got the subject's pillowcase".....

What scent do you think is on that pillowcase? What track might the tracking dog be following?



Then we've got Human Remains Detection/Cadaver dogs.

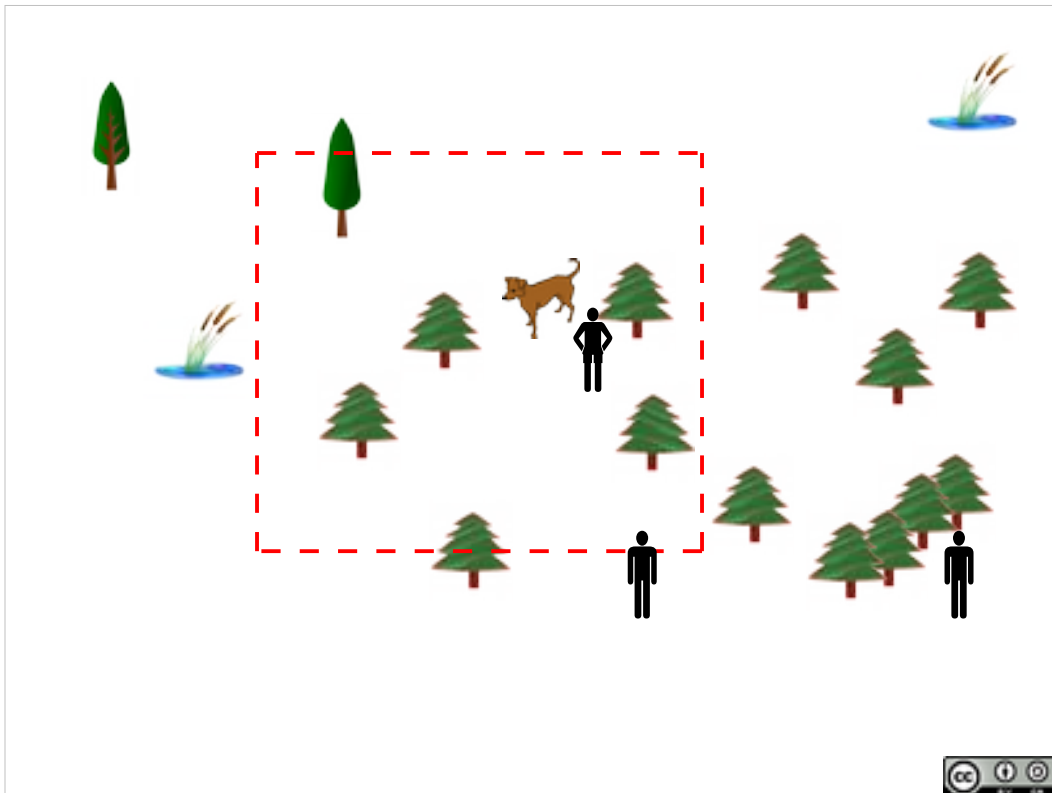
Imprinted on the scent of dead humans, proofed against the odors of dead animals.

Likely to show untrained alert behaviors while working into scent.



Trained final indication behavior at source.

Cadaver scent may travel with groundwater and the strongest source of scent (and the location of the trained indication) may be at a location different from where a body is buried.



HRD dogs tend to train towards detecting small scent sources in small areas (often 1-2 acres or less). Composition of tasks and support/navigation needs different from wilderness air scent.

Typically work in pairs, one working an area, another out of sight brought in to work the same area after the first dog has finished. See if both indicate on the same locations. For small areas, may be just one handler and one observer working the area with another handler waiting out of sight.

Can work with ground searchers on probe lines (detecting areas of less compacted soil). Can work with ground searchers looking for surface bone, etc.

The dog's ranging may be very directed by the handler, or it may not.



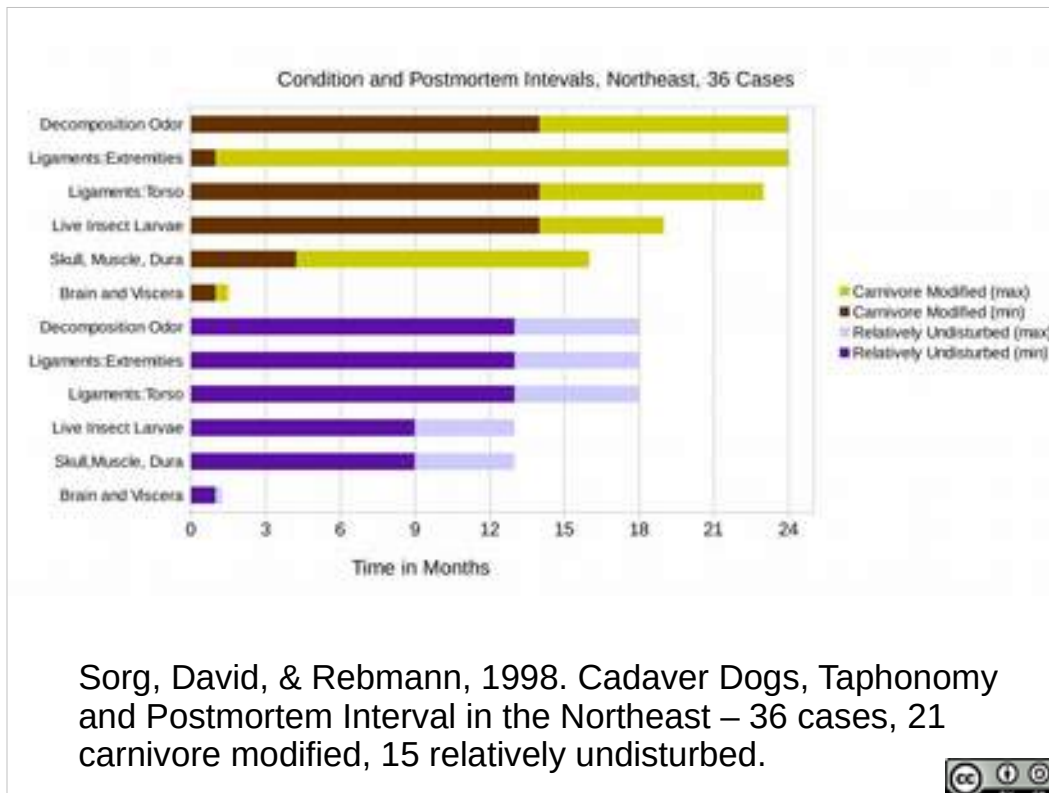
Human remains on the ground surface decay and are modified over time by scavengers.

Associated clothing and artifacts can decay and change over time.

How do changes to remains and artifacts affect detection?

The fabric in this setting (Cambodia) has retained vivid color on a decade time scale, it may not and may quickly blend in with the environment.

What you (and dogs) are looking for changes over time.



Some Regional data:

HRD and time. Data from the Northeast (Maine), only 36 cases, minimum and maximum times shown for carnivore (scavenger) modified and relatively undisturbed human remains.

Brain, Viscera, Finger & Toe bones < 1-1.5 months

Other soft tissues 4-15 months.

Ligaments, odor, 1-2 years.

Conditions of remains – time sensitive Less time, more odor.

(Carnivore (scavenger) modified larger than unmodified, could be effect of small sample sizes – take exact numbers with a grain of salt).



Then we have horses.

Horses can serve as sensors, as a high vantage point for searchers, and for transport.

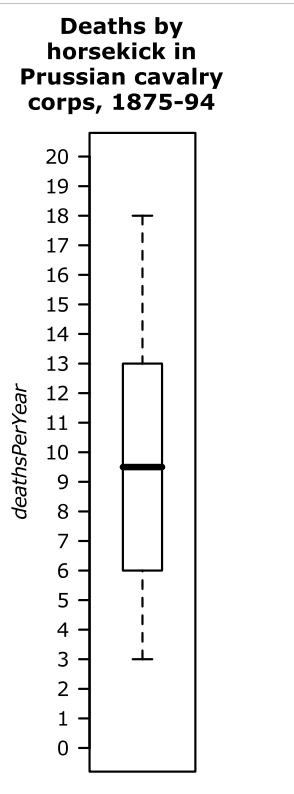
As sensors, tapping into horses' alertness as prey animals.

[Mounted SAR Canine unit heading out on a task in training in James River State Park, VA]



Horses are large and powerful.

Need to exercise caution working around them.



There are dangers, even for those experienced and used to working around horses.

Horses can startle at things the horse doesn't expect or like.

ATV – pull over, turn off, remove your helmet, let the horse pass.

Why remove helmet? (don't look like a human)

Dog, bring the horse off the trail, sit/down let the horse pass.

[graph: about 10 deaths per year from horse kicks in the prussian cavalry in the late 1800s – that's folks working with horses who are experienced with horses.]

Reading Ears



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The ears are one of the things that can inform you about what a horse is thinking.

Left, Ears back: upset, unhappy. Be extra cautious

Right, relaxed.



Attentive and alert.



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What's going on here?

Horse is detecting an unfamiliar odor.



Horses as sensors, as logistical support, and:

Under some limited conditions, it may be possible to use equines for transport and evacuation of an injured person.



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Practical evolution (2) Navigate three legs of the grid for a canine segment, including diverging to investigate.