# "77 FACTS" – SEARCH DOGS GENERAL INFO

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### THE TEAM

1. A search dog team consists of two (1 dog and 1 handler).
2. A search dog team is no better than it's weakest link - to meet expectations, the handler must be fit, search-wise, know his way around the country, be fully equipped, and believe his/her dog - who is usually the stronger link.
3. A search dog team needs to know:
   -Where to look and sniff.
   -How to cover the area to scent and see.
   -How to avoid other searchers.
4. A search dog team will often want to search the perimeter of its assigned sector first:
   -To cut for tracks - scent or sign.
   -To learn the boundaries of the assignment.
   -To check weather (wind speed, direction, irregularities).
5. A search dog team will prefer to search into the wind:
   -Zigzagging into the wind on small areas.
   -Parallel sweeps across the wind on larger areas.
   -Often along ridges and downhill with normal daytime updrafts.
   -Often up canyons and uphill, in morning and evening shadows when there are normally downdrafts.
6. A search dog team (at least the handler) will want a good map and orientation. More than most searchers, search dog teams are often on their own. Ed. Note: Many Search Managers will send a tracking aware searcher with the handler for safety, and to keep track of location and handle communications. This person can check an area when, for instance, a dog is working a scent pool.
7. A search dog team will need communications with search base. Most teams have their own radios but agencies should have the usual common frequency for Canada and the U.S. *added Ed.
8. A search dog team is effective at night:
   -Probability of detection is much greater at night.
   -Handler safety in terrain is the only reason to hold back search dog teams at night on a high priority search.
9. Other than night time, early morning, late afternoon and evening are the best times for a search dog team. Midday convection currents in summer decrease a dog's effectiveness.

### APPLICATION

10. The search dog team can search by air scent or wind scent within 15 minutes after other searchers have cleared the area. For air scenting, it does not matter how many have been there before or how long since the subject has been missing. (It helps if searchers haven't contaminated the area.)
11. Many air scenting dogs are cross-trained to trail or track and can do so if the area is undisturbed and the track is not too old.
12. A scent article is useful:
    -It must be un-contaminated by others than subject. (Upper body garment works very well)
    -If touched by others the dog should meet them so he knows they are not the subject.
    -Carry it in a Ziploc or paper bag. (No colored plastic bags. Use bag turned inside out ot pick up item, or, use metal tongs or coat hanger. Mark bag with date, time and name.)
13. A search dog is useful for covering large areas fast, with the least amount of forces committed to the search.
14. A search dog can search shrubbery, crawl spaces, and out-buildings in urban settings on house-to-house searches.
15. Some search dogs can work debris from floods, mudslides, tornadoes, explosions, plane crashes and earthquakes.

16. Some search dogs can work avalanches.
17. Some search dogs can search for evidence of crime.
18. Search dogs can locate drowned people in the bottom of lakes, or in rivers, or all bodies of water. Gases escaping from bodies rise to the surface and a dog in a boat will give an accurate indication.

**HOW IT WORKS**

19. Bodies, alive or dead, give off rafts of cells and gases and vapors constantly.
20. At least one third of cells emitted from humans are lighter than air (.014 microns or smaller) and stay suspended.
21. These airborne cells and odors act like smoke.
22. During calm days, with the sun over head, smoke and scent rise up from convective currents. This is the toughest time for dogs.
23. Wind will shear the convective column over along the ground and overcome the problem.
24. Cloudy days (low or midl\-level clouds) reduce convection and dogs do better.
25. Mornings and evenings and winter, when shadows are longer (the sun isn't overhead), are better for dogs
26. There is no convection at night, which is great for the dogs, usually.
27. On cold, dead calm nights, warmth of live bodies will cause some convective lift which can cause a problem on flat terrian. On hills, there will usually be downslope laminar flow of air to overcome this.

**SCENT PLUMES**

28. Scent plumes, like smoke, fall into several patterns depending on the weather: FUMIGATING night-time inversions break with morning sun and bring scents down into valleys and low spots. A subject on a hillside may be detected by a dog down below easily at this time. Dogs should be in the field before sunup. LOFTING is the reverse of fumigating. Stable air at the surface with unstable air aloft. Lofting happens after the sun sets and the ground is cooling but the air aloft is still warm, typical of valleys in the late afternoon and elsewhere in the early evening. On calm evenings where this situation occurs, handlers should work their dogs along ridges and higher slopes.*added Ed.
29. FANNING PLUMES occur at night in stable air. Scent will hold at the same elevational level. A dog may alert on a victim across a canyon at the same elevation but have no way to follow to him. Handlers should report alerts. A series of night-time alerts at the same elevation is an important clue: check elsewhere at that elevation.
30. CONING PLUMES are typical on cloud covered days and is the best thing going for air scenting dogs.
31. LOOPING PLUMES are typical of clear or high cloudy days, and midday, high convection situations. Scent will rise up, cool, loop back down, heat up again, rise back up, etc. The dog will alert, put it's headup, then lose the scent. An experienced handler will mark the map and possibly can get a direction from a line of these alerts. Sometimes several dogs in the field will establish the line over half a mile or so in this way, pointing to the subject.
32. Wind carries scent to the dog, but also disperses it. Convection disperses it too, even more so. At 100 meters from the source, at noon, on a clear, windless day the dog will receive 2% of the scent that he would receive on a clear night. A 12 MPH [19KPH] wind will equalize the situation, and he will catch 10-25% of the scent.

**PROBABILITY OF DETECTION (POD)**

33. POD varies for search dog teams according to wind, convection, terrain and vegetation barriers.
34. The handler part of the team will run at 50% POD just like a grid searcher at 100 ft.[30m], except the dog handler will be covering about one-third of the country (16.5%), since the handler is more likely gridding at 300 ft. [100m]. (Only 100 ft. [30m] will be covered in every 300 ft. [100m] by the handler's eyes alone.)
35. The dog's POD will run from 5% to 95% at 300 ft. [100m] based on weather conditions. 36) The dog/handler search team then, in a sense, is double coverage and will vary from 21 to 96% POD. NASAR (National Association for Search and Rescue) has used a figure of 50% which isn't a bad average; but remember it's an average of a wide range. Areas searched morning and evening are much higher than midday in summer.

**LOGISTICS**

36. Dogs are trained to ride in anything a handler can manage (Search Manager must arrange): chairlifts
helicopters

sling harness
pickups
snow machine sleds
aircraft
boats

37. From a practical standpoint, they are limited in steep, rocky, cliff country.
38. Dogs navigate most brush better than most people.
39. Dogs tire in deep powder snow, but the heavier coated breeds will still search.
40. Dogs require 2 pounds of dog food (dry kibble) each day. The handler will bring some, but on an extended search you should get a 50lb bag of the handler's brand for your teams.
41. Dogs will need at least as much water as the handlers. If there are streams, springs, etc. OK. But in dry country they'll need water rations too. In winter conditions, pack extra water for the dog.
42. Dogs will stay with their handlers at night:
    -In a tent.
    -In the field.
    -In a motel. Handlers will tent rather than leave their dogs, so clear it with the motel. Holiday Inn, Motel 6, and many others normally accept trained dogs.

**MORE ON TRACKING AND TRAILING**

43. Two-thirds of scent given off by the subject is heavier than air. It falls to the ground or blows alongside to the ground. These heavier particles form a trail.
44. As the bacteria on the scent particles (skin cells) digest the protein they convert the cells to vapors. The trailing dogs will follow this scent.
45. The longer the bacteria works on the protein, the more it is consumed, until at last, it is all gone.
46. Warm, moist weather causes the fastest rate of conversion, more scent, shorter duration.
47. Very dry weather, hot or cold, gives less scent but sometimes longer duration.
48. A sunbaked particle of protein may have no bacterial action - no scent.
49. After a light rain or morning dew, it may be rejuvenated.
50. When the subject's feet step on vegetation or scuff the dirt, new bacteria is turned up in the soil and cells are crushed in the plants. The cells begin to ferment and the ground smells different. A tracking dog can work these vegetable and soil scents the same as a trailing dog does the human scent particles. Many dogs do both.
51. Some search dogs are cross-trained to air scent, trail and track.
52. Most search dogs will alert to clues as well as people: packs, clothing, etc.

**THE DOG**

53. A search dog has 44 times more olfactory sensory cells than a human. He's a super sniffer.
54. A dog's olfactory lobes take up nearly one-eighth of his brain. He's scent smart.
55. A dog can perceive certain smells in the range of one part in ten quadrillion (10-15). That's incredible but true.
56. A double-coated dog's coat is good insulation. It keeps him warm in winter, cool in summer.
57. A dog's cooling mechanism is evaporation through tongue and pads.
58. A dog is susceptible to hyperthermia in hot, humid climates. Swimming or dunking helps. (Or wetting down with bucket or wet towel for short-coated breeds - weeting feet will help too.)

**THE WEATHER AND SCENT TRANSPORT AND DIFFUSION**

59. You can judge the potential convection by measuring your shadow and looking at the sky:
    Nighttime or overcast with low clouds = no convection
    Daytime and partly low cloudy = low to moderate convection
    Daytime, clear, or mid to high clouds, over 8.5 [2.6m] foot shadow = moderate convection
    Daytime, clear, or mid to high clouds, 3.5 [1m] to 8.5 [2.6m] foot shadow = high convection
    Daytime, clear, or mid to high clouds, under 3.5 [1m] foot shadow = very high convection

60. Wind helps to overcome convection. You'll need a moderate breeze of 13-18 mph [21-29 kph] to overcome very high convection. You will know, if the wind is raising dust and small branches move, that you've got 13 mph [21 kph] or more.
61. Large roll eddies on the lee of ridges and canyon rims cause upslope winds blowing opposite the prevailing wind.
62. Eddies form at bends in canyons and at the mouth of tributaries, bringing scent from different directions.
63. Ridge top saddles and mountain passes increase wind flow. They are a good place to pick up air scents.
64. At edges of meadows, behind hedgerows, at any break in vegetation, expect eddies. Check all the edges, the scent may not be carried away on the breeze.
65. Openings in a forest will heat up and bring a draft into the opening from all directions. Check the middle of openings to take advantage of it.
66. A tree or telephone pole in a field can act like a chimney too. Check around it.
67. Don't expect as much wind in a dense forest as in the open. A 20 mph [32 kph] fresh breeze will be slowed down to 4 mph [6 kph]. A 4mph [6kph] breeze will only be slowed to 2.5 mph [4 kph] though.
68. When the sun is on the slopes of a hill, there will normally be an updraft flow of air. During the day, major canyons will have an upstream breeze. This will carry the updrafts on the slopes diagonally upslope and upstream.
69. The updrafts increase in velocity as they rise. The ridges are receiving scents from off the whole slope.
70. As the side slopes go into shadow, downdrafts begin. It is good to search from the bottom up at this time.
71. Downdrafts are laminar, in thin layers, and flow down like water. Debris piles and brush can act like a dam. Hollows and low shady spots may have scent pooling in them. The mouths of side drainages are good places to check in the shade and at night.
72. Thunderstorm downdrafts push air out in all directions from directly under the cell at the mature stage. A dog can alert from a great distance, so note the location of the thunderhead and the wind direction if the dog alerts.
73. Before reaching a mature stage which has rain, the thunderhead will have a strong convective updraft and will be sucking air toward it. It is important to keep track of what is happening and note the time of the alerts since the wind may be going one way one minute and the other way the next.
74. Smoke candles help you judge what's happening. They are a good tool to use ) in practice sessions occasionally. One source is Ben Meadows Co., P.O. Box 80549, Atlanta, GA 30366 or P.O. Box 2781, Eugene, OR 97402 (Item 171352).

**MISC**

75. There are at least 90 search dog units in the country. They vary in versatility and expertise. Most Bloodhounds don't area search (there are exceptions). A number of air scenting teams don't track or trail, but many do. In the U.S. you can obtain teams through the Air Force RCC at Scott AFB (800-851-3051). Be sure to give an idea of the situation, terrain, weather, etc. and how many teams you need.
76. Search dog teams can reduce manpower needs. One dog/handler team can clear about one half sq mile [1.3 sq km] per day on average, sometimes more. (Or less in some mountain country.) If your primary search area is everything in a three mile radius from the PLS, one dog team will take a couple of months. Better to ask for 20 teams and and hope the country isn't worse than average.