

## **Locating Expended Shells with Evidence Search K-9s**

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Using dogs trained to search for evidence and expended firearm cartridges is the most efficient way to find evidence at outdoor shooting scenes. The Maine Warden Service has used K-9s for years to find shells at poaching scenes, scenes that can be very large in size. The K-9s were trained in evidence detection with extra practice on expended shells. Expended rifle and shotguns shells retain unburned powder residue, so evidence K-9s quickly learn to key on this odor in addition to any human scent. Pistol and rim fire cartridges burn much hotter and more completely, so they have less powder residue and therefore require a closer search pattern.

Metal detectors can find expended shells, but they don't work as fast or as effectively as a trained dog, and they don't work unless the detector passes directly over the shell within a distance of a few feet. Heavy vegetation and other debris make the use of metal detectors impractical. Detectors may not be as selective as a dog and, if there is any amount of trash or metal objects in the area, the operator spends a great deal of time investigating false signals. One advantage to detectors is that metal detectors will work some time after the crime, whereas dogs may be limited to a few days or weeks, depending on how much rain falls and washes away powder residue. Warden Service K-9s have successfully located shells two weeks after an animal was shot when searching conditions were optimal.

If a K-9 that has worked extensively on shells can get to the scene quickly after the shooting, or before rain or dew falls, often the dog will alert on expended powder where the shooter was standing. Handlers who are good at reading their dogs as they search off lead at an uncontaminated scene may be able to tell where the suspect was standing or walked or discharged a firearm by reading the dog's actions. Besides following human tracks on fresh scenes, the dog will usually trace out an expended powder "cone" while searching. If a vertical structure, like a bush, is nearby, the dog often sniffs the side of the bush with the powder deposit, giving officers an idea of what direction the shooter was shooting. Scenes where shots are fired can be set up in training for handlers to see the effects on the dogs' alerts.

### **Strategies for Searching**

To plan the most efficient search, start at the bullet strike by trying to determine what direction the shooter fired from. A trajectory may be obtained by a bullet strike, blood spatter or similar evidence, or witness observations. Looking in that direction and analyzing the events and area will usually give an officer an idea of the areas to work first. Vegetation, hills or structures may block line of sight or bullet path, narrowing the possible search area down to places someone can aim and fire from.

If other officers have already searched in the area, wait an hour or more for their fresh scent to dissipate. The dog will work much better at a rested scene than at a freshly contaminated scene. The ideal situation would be to work before others have contaminated the scene, but unfortunately officers can't seem to resist looking themselves before they call K-9.

The most effective times to search for evidence is when the ground is heating up. This makes the scent rise off the evidence and become available to the K-9. A study done in Florida showed that evidence K-9s were most effective when the sun was out to warm the ground. Sun was more important than the age of the scene in the study. Each day that passed, the experienced evidence detection dog used in the study lost about 20% of his effectiveness. The study from the Journal of Forensic Identification, 56(A);2006 was summarized in the IPWDA Journal, Vol.4 , Issue 3, Fall 2007, pages 10 and 11 in an article by Mark Mathis with the title of "Results Reported from 2,000 Article Searches."

Don't even bother to search during rain or snow storms. I have found that the scent is so depressed during a heavy rain that dogs will walk right over items that they find easily when the rain stops. High winds will dissipate scent excessively, but light winds will help the dog by creating scent cones the dog can intersect in its search.

If a distraction like an animal carcass, blood or other decomposing tissues exists at the scene, or other officers, live animals, etc., that can't be moved, I recommend first taking the dog up to the carcass or distraction on lead and letting the dog satisfy his curiosity before searching (within reason). Sometimes this is all it takes to get the dog to work. If the dog is still distracted, try to search in a way that works away from the distraction so that the handler is between the dog and the distraction and the dog is not working towards the distraction. If the dog still won't work, more training may be needed to fix the problem. Avoid correcting the dog severely around a distraction at the crime scene because the dog may just shut down near the distraction and not locate valuable evidence that is near the distraction. If the distraction is the carcass of an animal, often "finishing" shots are fired near the carcass, so this is an area that should be searched closely, possibly with a metal detector if the dog won't worked effectively close to the carcass.

Many poached animals are shot from vehicles travelling on roads. To do busy roadsides, a dog should be trained to work on lead to keep the dog safe. While working on lead is not ideal because the dog is not as free to search, on lead searching needs to be an option for evidence search K-9s.

As with any search exercise, the handler needs to have a plan for systematically covering the area. Only then can the handler know whether or not the area has been thoroughly searched and all the possible evidence recovered.