



# A CRIME SCENE WALK ON THE WILD SIDE

By F. Carleen Gonder, MIS

## Reading Bullet Evidence

Written by Tony Latham

**I**t takes no training to read footprints in fresh snow left by perpetrators at a wildlife crime scene. Any officer can exam the prints to know how many people were at the scene, what their shoe treads look like, where they exited their vehicle and come up with a pretty good theory on what happened at the scene. A comparison to the officer's stride and shoe length will also give him/her an idea about the physical size of the perps.

In many ways, reading a bullet recovered from a carcass is like reading the tracks in the snow.

The overall appearance of a recovered bullet will tell you the firearm used by the perp is consistent with a rifle, pistol, muzzleloader, or shotgun. The vast majority of wildlife crimes I investigated in Idaho in my career involved rifles.

For the sake of this article, let's assume you've dug out the bullet and have concluded the bullet is consistent with having been fired from a rifle.

And how do we come to this conclusion? Cartridges designed for rifles gen-

erally have a longer bullet than those designed for handguns. Most handgun bullets used in wildlife crimes are of a larger caliber than rifle bullets. Thus a relatively short bullet with a diameter between .35" and .45" was PROBABLY fired from a pistol.

We can further exam the bullet and come up with a very rough theory of the velocity of the bullet based on its deformation and penetration in relation to the distance from where you believe the shot was fired from. Try to break the estimated velocity into low, medium, or high velocity cartridges. Examples of these three categories would include cartridges such as .30-30 Winchester, .30-06 Springfield, or .300 Winchester Magnum. If your projectile was fired from about a hundred yards broadside into a whitetail and failed to exit the animal, you can conclude it probably wasn't one of the "magnum" high velocity cartridges.

The next characteristic you should look at is the diameter of the bullet to conclude the caliber of the firearm it was

fired from. At this point in your examination let's measure the diameter to a thousandth of an inch (such as .XXX"). Your bullet is probably going to somewhat distorted so make sure you measure the bullet at several points.

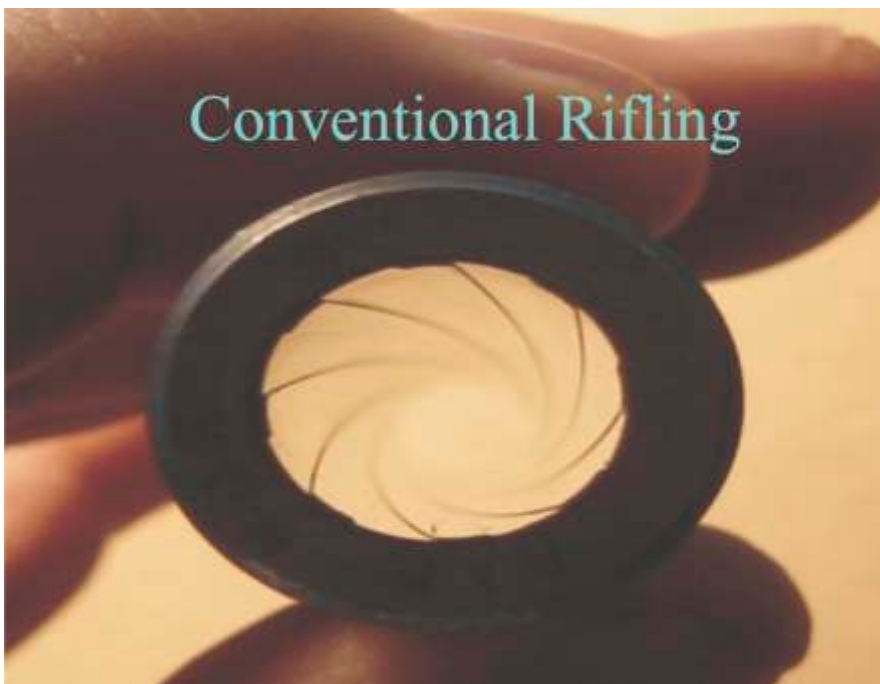
A set of digital calipers will cost about \$25 from an Internet tool company. The Harbor Freight composite calipers (item #93293) are a fine bargain at \$10. The composite calipers will help prevent accidental marring of your evidence. I prefer digital calipers since you can toggle back and forth between inches and millimeters.

Once you've come up with a caliber, keep in mind the fact the name of the cartridge can be misleading as to the bullet's diameter it is loaded with. For example, a .44 Magnum cartridge is loaded with a .429" bullet. The .357 Magnum fires the same diameter bullet as the .38 Special. A reloading manual is a tremendous tool to help you figure out the possible factory cartridges that your particular bullet came from.

At this point, let's take a look at the construction of the bullet. When I started as a warden in 1987, almost all the big game cartridges were loaded with simple copper jacketed lead bullets. These days, it seems that every bullet maker has a line of high-dollar bullets that are specially constructed or bonded. Don't be too concerned at this point in your examination with that particular facet, just look for physical characteristics that jump out at you.

What does the base of the bullet look like? Is it copper just like the rest of the external portion of the bullet? Is there lead exposed at the base? What does the corner of the base/side of the bullet look like? Is it squared off? Or was it constructed with a round bevel at the base/side transition?

Is it a boat-tail? Boat-tailed shaped bullets are just what they sound like. Towards the rear of the bullet it tapers back to the "stern" of the bullet. Some bullets have a cannellure or "crimp ring" that is impressed into the circumference





Barrel Examination

of the bullet where the bullet is seated into the case.

Is there something really curious about this bullet? Is it a typical copper jacketed lead bullet or is it rather unique such as a solid copper Barnes bullet?

Frequently some of the cheaper foreign manufactured ammunition is made with steel alloy jackets. It may be time to get your magnetic steel shot detector out and check the bullet for magnetic properties. (Wolf is one such manufacturer)

At this phase of your examination you should start using a 10X eye loupe. I prefer the jeweler's loupe that fits into your orbit around your eye since they leave both hands free to compare two items under magnification. (Again, you can purchase a good inexpensive eye loupe at Harbor Freight.)

Lets start looking at the markings left by the shooter's barrel on your bullet. There are two general types of rifling methods used by barrel manufacturers, conventional and hammer forged. With both methods the twist is either right hand (clockwise) or left hand. Only about 15% of the barrels are manufactured with left hand rifling.

Conventional rifling has lands and grooves that are cut into the barrel. There is always the same number of lands as there are grooves. On your bullet the deep impressed marks are from the barrel's lands. The number of lands/grooves will be as few as 2 lands and 2 grooves. I have seen firearms with as many as 20 lands and 20 grooves. 6

and 6 being the most common.

Conventional land and groove width varies greatly from one firearm to the next. You can exam two .30 caliber bullets, each having 6 and 6 rifling characteristics, place them base to base, and note that they either have the same land groove widths or noticeably different widths. If they are have the same land/groove widths, your radar should come up!

To determine the direction of the twist in the suspect's barrel. Hold the bullet with the base down and point up. If the bullet was fired from a barrel with a right hand twist, the impressions will angle to the right.

Hammer forged barrels are almost exclusively manufactured in Europe. A bullet fired from a hammer-forged barrel will not exhibit a definite transition between land and groove impression but will be polygonal or hexagonal in shape.

On most wildlife crimes that fall into the "who-dunit" category, at some point in the investigation you are trying to connect your suspect to the crime scene. All of these physical characteristics you've noted on your bullet such as the transition forming the base and side or crimp ring will be found in the loaded cartridges possessed by your shooter. His firearm is obviously going to have the same rifling characteristics as those impressed into your bullet.

Now lets exam the barrel of your suspect's firearm. (Again, if he is present, use good officer safety). You can use

either silly putty or modeling clay to examine the rifling characteristics of the firearm.

Form a cylinder using the putty and press it into the barrel about a half an inch. Pull it out and exam the impression in your putty. Count the lands and grooves and note the direction of the twist. Now, compare your barrel impression with your evidence bullet by placing the putty impression on the base of the bullet and line up your land and groove impressions of both articles. They are either going to match up or they are not.

If the rifling characteristics match up, it doesn't automatically mean THE bullet came from this rifle. But it sure increases your probable cause. If your suspect is present, and you have a second "cover" officer present, it's a great time to look over at your officer and give him a slight nod. You should notice your suspect's head slump a bit at this point and it's a great time to sit down and pull a confession out of him.

Speaking of pulling, every good game warden carries a bullet puller in the form of a pair of pliers. Don't hesitate to pull a bullet from one of the cartridges you've obtained from your suspect and compare it with your evidence bullet. In my 22 years as a warden I do not recall a suspect that failed to allow me to take one of his cartridges and pull a bullet.

Firearm evidence tells the tale similar to tracks in the snow. Spend the time to learn these simple skills and sooner or later they will help you solve a case.

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- *Tony Latham is now retired and was formerly employed by Idaho Fish and Game. He has been teaching classes with Carleen Gonder over the past few years and currently teaches a class that is Idaho POST certified titled: Field Firearms Evidence Analysis. He has presented this course to over 1,800 wildlife officers in North America since 2004.*
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Each column will highlight one topic and include contact information. Readers are encouraged to contact me with feedback and ideas for future columns. **F. Carleen Gonder, MIS Founder and executive director of Wildlife Field Forensics**  
PO Box 74, Ovando, MT 59854 PH: (406) 793-7007; email: carleen\_montana@yahoo.com