

A Guide to Identifying Livestock Depredation

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AND

RANGE IMPROVEMENT TASK FORCE

Report 77



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PREDATOR DEPREDATION

Predator depredation can be detrimental to a livestock operation. In order to take steps to help mitigate or discourage predation upon livestock, it is essential to know what predator you are dealing with. Fortunately, if there is enough evidence left behind, certain kill characteristics can be used to identify the predators involved.

One of the first steps in evaluating livestock deaths is to survey the site to confirm it was a predator attack. It is important to distinguish between predation, scavenging, and other causes of death such as disease or starvation. Look for signs of struggle including blood trails, hair and hide, broken vegetation, and displaced rocks and soil. Note the position of the carcass, as livestock lying with their legs folded under them are likely to have died from something other than predation. Examine the site for predator tracks and scat before disturbing the carcass. However, remember that the presence of tracks and scat does not necessarily confirm predation because predators will also scavenge animals dead of other causes.

Once the site has been thoroughly examined, inspect the carcass itself. Hemorrhaging is one of the most important factors in determining whether predation was the cause of death. Bleeding will normally occur around bite marks and also in cases where animals suffered severe trauma, whether it be from the strong blow of a predator's paw or from injuries sustained from falling. Skinning back what is left of the carcass will reveal if any trauma or hemorrhaging has occurred beneath the skin in the throat, neck, back, or hind-quarter region (Figure 1). Note if there are any broken or chewed bones. If evidence suggests predation as the cause of death, the following descriptions of predator kill characteristics can assist in determining the species responsible for the depredation.



Figure 1. Hemorrhaging

IF YOU SUSPECT A DEPREDATION:

1. Do not disturb the site.
2. Secure the site.
3. Note the location for reporting accuracy.

Call the local Wildlife Service Specialist or
USDA/APHIS/Wildlife Services

8441 Washington St. NE

Albuquerque, NM 87113

State Office: (505) 346-2640

Contact the Local Game Warden or
New Mexico Department of Game and Fish

1 Wildlife Way

Santa Fe, NM 87507

State Office: (505) 476-8000

BLACK BEAR

References:

Halfpenny, J., and T. Telander. 1998. Scat and tracks of the Rocky Mountains. A Falcon Guide. Falcon Publishing, Inc., Helena, Montana.

Reed, J.E., R.J. Baker, W.B. Ballard, and B.T. Kelly. 2004. Differentiating Mexican gray wolf and coyote scats using DNA analysis. Wildlife Society Bulletin 32: 685-692.

Pictures provided by Laura Schneberger (Gila Livestock Growers Association), except for figures 4, 6, and 9 courtesy of Wildlife Services.

Additional Resources:

Elbroch, M. 2003. Mammal tracks and sign: A guide to North American species. Stackpole Books. Mechanicsburg, Pennsylvania.

Murie, O. 1982. A field guide to animal tracks. Peterson Field Guides. Houghton Mifflin Company. New York, New York.

Wade, D. A., and J. E. Brown. 1981. Procedures for evaluating predation on livestock and wildlife. Texas Agricultural Extension Service, College Station, Texas.

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Black bear predation on livestock tends to be more common during the spring and summer months due to limited natural food sources (berries, nuts, etc.). Typically bears will kill their prey by biting the neck and shoulders or sometimes by breaking the neck with a blow to the head from their powerful paws. Livestock that have fallen prey to bears are usually left as torn, mauled, or mutilated carcasses. Claw marks can frequently be found on the neck, back, and shoulders and are about ½ inch (1.3 cm) in size between individual marks. Canine tooth holes are much larger than canids at approximately ½ inch (1.3 cm) in diameter (Figure 2). Bears prefer to feed in seclusion and will often drag their prey to cover. They usually prefer the viscera and frequently leave the skin and skeleton intact. Carcasses are rarely scattered by black bears. However, when most of the prey is consumed, the skin will be stripped back and turned inside out. Bears also have been known to eat the udder of lactating females, presumably to obtain the milk (Figure 3).

Bear tracks and feces are usually found nearby the kill site along with a bed site or matted down vegetation. Tracks are distinct with five toes with a short broad pad on the front foot and five toes with a triangular pad on the rear foot. The front paw of an adult black bear ranges from 3 ¼ (8.3 cm) to 5 ½ inches (14.0 cm) wide and 5 to 6 ½ inches (12.7-16.5 cm) long (Figure 9). The hind paw is typically the same width as the front paw but is 6 to 7 ¾ inches (15.2-19.7 cm) in length. Generally a 200 pound bear will make tracks approximately 4 inches wide .

Black bear scat is usually tubular in the form of logs or piles and are between 1 ⅜ and 1 ½ inches (1.4-1.5 cm) in diameter (Figure 13). Depending on what the bear is feeding upon, black bear scat will usually contain nuts, berries, plant material, and the remains of small mammals.



Figure 2. Black bear attack on calf showing tooth punctures wounds.

Figure 3. Black bears occasionally consume the udder of cows.



MOUNTAIN LION

Lions often stalk their prey and attack by leaping on their shoulders and back, biting the top of the neck or head. Their jaws are strong enough to bite through the skull, crushing it. Claw marks and tooth punctures are usually evident along the shoulders and neck. The upper canine teeth of mountain lions are approximately $\frac{1}{2}$ inch (1.3 cm) in diameter and $1\frac{1}{2}$ to $2\frac{1}{4}$ inches (3.8-5.7 cm) apart, with lower teeth approximately $\frac{3}{8}$ to $\frac{1}{2}$ inch (1.0-1.3 cm) closer together. In general, lions begin feeding upon the viscera through the abdomen or thorax; however, some individuals will feed first on the neck and front quarters. Tissue and bones are left with clean-cut edges in comparison to the ragged edges left by coyotes. Large bones are often broken. Prey is usually dragged or carried into bushy areas to feed, and they will normally cache kills by covering them with soil and vegetation, often to come back at a later time (Figure 4). Normally lions do not feed on carrion other than their own kills or possibly those taken away from other predators.

Lion tracks are easily distinguishable from wolves and coyotes since they rarely show any claw marks (Figure 10). Tracks are larger than coyotes and approximately 4 inches (10.2 cm) in length and $4\frac{1}{4}$ inches (10.8 cm) in width.

Mountain lions use their scat as territorial markings and often deposit feces in open areas such as the middle of trails and dirt roads. Their scat is segmented and similar to the size of dog scat, usually measuring over 1 inch (2.5 cm) in diameter (Figure 14). However, lion scat has rounder ends than those of canines. One of the most noticeable features of mountain lion scat is the presence of considerable amounts of hair.



Figure 4. Donkey killed and cached by a mountain lion.

SCAT

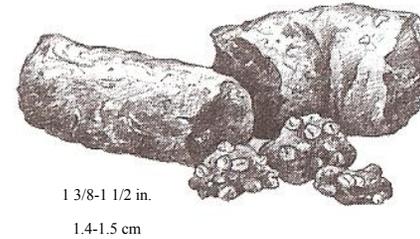


Figure 13. Black bear scat

Figure 14. Mountain lion scat

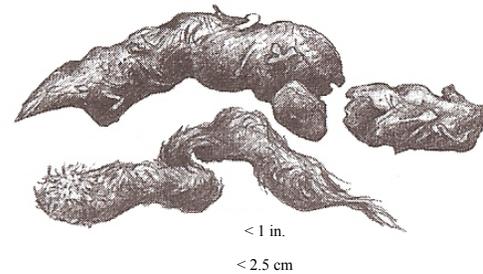
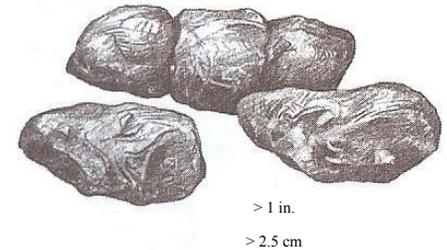
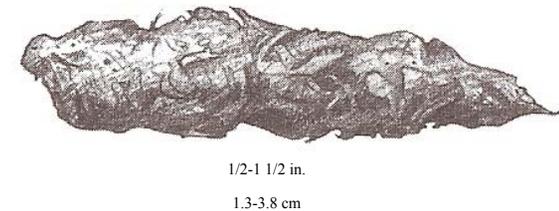


Figure 15. Coyote scat

Figure 16. Wolf scat



Measurements are taken from text and images are taken from Halfpenny and Telander 1998.

Figure 9. Black bear track

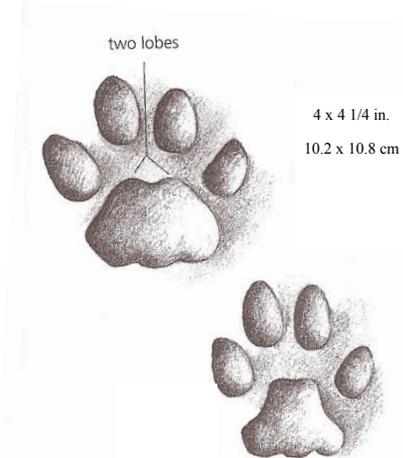


Figure 10. Mountain lion track

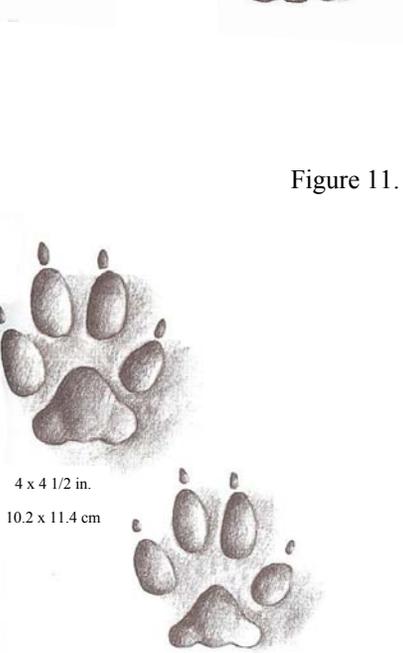


Figure 11. Coyote track

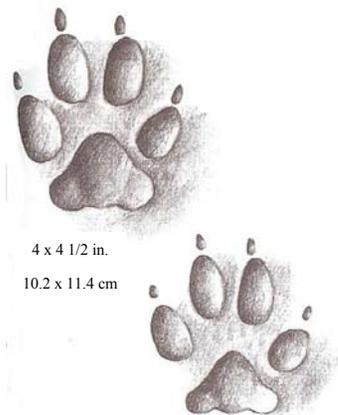
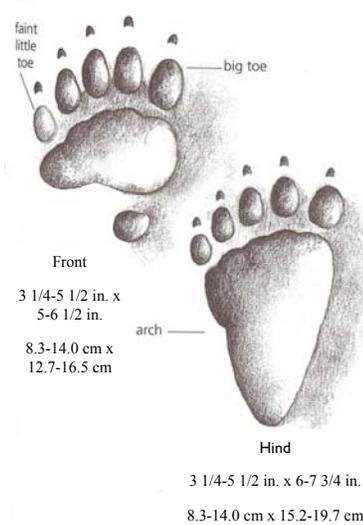


Figure 12. Mexican wolf track



Coyotes normally kill their prey with a bite to the throat just behind the jaw and below the ear, with death resulting from suffocation and shock. Coyote predation tends to vary by individuals and some kill by attacking the hindquarters resulting in shock and significant blood loss. Normally they will begin feeding in the flank region or behind the ribs; however, some choose the viscera first. Carcasses fed upon by coyotes will exhibit ragged edges on tissue and tendons, along with chewed and broken bones that are scattered around the feeding site (Figure 5). Puncture wounds are usually evident in the neck region with normal spacing between the upper canine teeth about $1 \frac{1}{8}$ to $1 \frac{3}{8}$ inches (2.9-3.5 cm) (Figure 6). The canine tooth holes are about $\frac{1}{8}$ inch (0.3 cm) in diameter. However, an accurate estimate of canine tooth size and spacing is not always possible due to tissue pliancy and multiple bite wounds that may occur. Unlike wolves, coyotes sometimes readjust their grip in the throat area leaving multiple tooth holes, whereas wolves typically have a single set of large tooth holes. Domestic dogs do not normally kill for food and attacks by dogs usually lead to mutilated carcasses. Domestic dogs are more likely to chase and harass livestock and evidence often reveals many attack sites with tracks, hair, and pieces of skin widely scattered. Dogs are more likely to wound animals in the hindquarters or head and often severely mutilate the animal.

Coyote tracks are generally longer than they are wide with only the front two claw marks visible. On average they are $1 \frac{1}{2}$ inches (3.8 cm) wide and $2 \frac{1}{2}$ inches (6.4 cm) long (Figure 11). Dog tracks typically are as wide as they are long and all four claw marks are usually visible. Also, dog tracks will appear staggered whereas coyote tracks are in a straight line.

Coyote scat varies depending on the diet and may contain bone, hair, berries, and seeds usually cigar shaped, measuring less than 1 inch (2.5 cm) in diameter (Figure 15). However, if found shortly after feeding on large animals, scat may be formless and dark red to black in color. Domestic dog scat is usually aggregated, lack a tapered end, and has a more consistent appearance attributed to the uniformity of domestic dog foods.



Figure 5. Coyote predation on cattle.



Figure 6. Coyote bites on top of shoulders with $1 \frac{1}{8}$ inch tooth spacing.

MEXICAN GRAY WOLF

Generally wolves are known to attack their prey by lunging and biting at the hindquarters and flanks, damaging the muscles and ligaments causing them to become weak and stiff (Figure 7). Once the animal is badly wounded and falls, wolves will attempt to disembowel it. Claw and teeth marks may be found on the hindquarters as well as bite marks at the shoulders and sides. Large livestock killed by wolves are consumed at the kill site, after subsequent feedings the carcass is usually torn apart and scattered around the site as bones are often broken, chewed, and carried off. Canine tooth holes are roughly twice as large as coyotes at $\frac{1}{4}$ inch (0.6 cm) in diameter. Average spacing between the upper canine teeth is approximately $1\frac{1}{2}$ to $1\frac{3}{4}$ inches (3.8-4.4 cm) (Figure 8).

Tracks are similar to that of coyotes but generally are larger with the hind foot averaging $3\frac{1}{2}$ inches (8.9 cm). The front paw averages 4 inches (10.2 cm) wide and $4\frac{1}{2}$ inches (11.4 cm) long (Figure 12). Wolf toes point straight ahead and are closer together.

Wolf scat is very similar to that of coyotes and can range from $\frac{1}{2}$ to 1 $\frac{1}{2}$ inches (1.3-3.8 cm) in diameter (Figure 16). In fact, using morphological measurements such as length, diameter, and mass have proven inaccurate in correctly identifying Mexican gray wolves from coyotes and DNA analysis is considered to be more definitive (Reed et al. 2004).



Figure 7. Mexican wolf predation on cattle.



Figure 8. Mexican wolf canine spacing.

| SPECIES | CANINE SPACING (IN.) | CANINE DIAMETER (IN.) | TRACK SIZE (IN.) | SCAT DIAMETER (IN.) |
|--------------|---------------------------------|-----------------------|--|---------------------------------|
| BEAR | INFORMATION NOT AVAILABLE | $\frac{1}{2}$ | $3\frac{1}{4}$ - $5\frac{1}{2} \times$ 5 - $6\frac{1}{2}$ | $1\frac{3}{8}$ - $1\frac{1}{2}$ |
| MT. LION | $1\frac{1}{2}$ - $2\frac{1}{4}$ | $\frac{1}{2}$ | $4\frac{1}{4} \times 4$ | > 1 |
| COYOTE | $1\frac{1}{8}$ - $1\frac{3}{8}$ | $\frac{1}{8}$ | $1\frac{1}{2} \times 2\frac{1}{2}$ | < 1 |
| DOMESTIC DOG | VARIABLE | VARIABLE | $\sim 1\frac{3}{4} \times 3\frac{1}{4}$ | ~ 1 |
| WOLF | $1\frac{1}{2}$ - $1\frac{3}{4}$ | $\frac{1}{4}$ | $4 \times 4\frac{1}{2}$ | $\frac{1}{2}$ - $1\frac{1}{2}$ |

APPEARANCE OF KILLS

BEAR:

- Torn, mutilated, mauled carcass, but rarely scattered
- Skin stripped back and turned inside out

MOUNTAIN LION:

- Claw/teeth marks found along shoulders and neck
- Tissue and bones left with clean-cut edges
- Carcass is cached, covered in dirt/vegetation

COYOTE:

- Bite marks, bruising under neck/throat or hindquarters
- Chewed and broken bones with ragged edges

DOG:

- Bites on multiple areas
- Do not usually feed on prey
- Mutilated carcasses

WOLF:

- Claw/teeth marks found on hindquarters, shoulders, and sides
- Carcass usually torn apart and scattered around site